

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, D.C. 20436

In the Matter of)
)
 CERTAIN VIDEO GRAPHICS DISPLAY)
 CONTROLLERS AND PRODUCTS)
 CONTAINING SAME) Inv. No. 337-TA-412

CONFIDENTIAL

CIRCUIS CONFIDENTIAL BUSINESS INFORMATION

DEPOSITION OF DAVID A. KEENE

000547100

Date: Monday, November 9, 1998
 Time: 9:55 a.m.
 Location: FISH & RICHARDSON
 2200 Sand Hill Road, Suite 100
 Menlo Park, California 94025

APPEARANCES:

For ATI FISH & RICHARDSON
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For Cirrus Logic, MORRISON & FOERSTER LLP
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- (1) -ooo-
- (2) DAVID A. KEENE,
- (3) being duly sworn by the certified shorthand reporter
- (4) to tell the truth, the whole truth and nothing but
- (5) the truth, testified as follows:
- (6) EXAMINATION BY MS. KORDZIEL:
- (7) Q Good morning. My name's Linda Kordziel, and I
- (8) represent ATI Technologies in an investigation before
- (9) the U.S. International Trade Commission.
- (10) Could you please state your name and
- (11) address for the record?
- (12) A My name is David Keene, and my address is 48
- (13) Northam Avenue in San Carlos.
- (14) Q Have you ever been deposed before, Mr. Keene?
- (15) A Nope.
- (16) Q I'll be asking you questions, and if you have
- (17) any questions, I can rephrase it for you. If at any
- (18) time you want to take a break, please let me know and
- (19) we'll take a break.
- (20) A Understood.
- (21) MS. KORDZIEL: I'd like to have this
- (22) marked as Exhibit Number 1. It's the deposition
- (23) notice of David A. Keene.
- (24) (Marked for identification: Respondent's
- (25) Exhibit Number 1.)

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- (1) Q (By Ms. Kordziel): Have you seen
- (2) this notice before?
- (3) A Yes.
- (4) MR. JACOBS: Excuse me. You get that one
- (5) that's marked and I get this one. We'll get the
- (6) drill down.
- (7) MS. KORDZIEL: Also let's go ahead and
- (8) mark this as Exhibit 2.
- (9) (Marked for identification: Respondent's
- (10) Exhibit Number 2.)
- (11) Q (By Ms. Kordziel): It's a Subpoena
- (12) Ad Testificandum for Mr. David Keene. Have you seen
- (13) this document before?
- (14) A Yes, I have.
- (15) Q There was some confusion, I guess, so we went
- (16) ahead and got the subpoena in addition to issuing the
- (17) deposition notice.
- (18) Now is counsel representing you
- (19) personally during this deposition?
- (20) A I don't understand what - who -
- (21) MR. JACOBS: We can get you an answer.
- (22) THE WITNESS: - what that means.
- (23) (A discussion was held off the record.)
- (24) THE WITNESS: Okay. I guess the answer
- (25) is yes. I'm not employed at Cirrus Logic presently.

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- (1) so -
- (2) Q (By Ms. Kordziel): Have you retained
- (3) Mr. Jacobs?
- (4) (A discussion was held off the record.)
- (5) MS. KORDZIEL: Please -
- (6) MR. JACOBS: Whatever.
- (7) Q (By Ms. Kordziel): - let the
- (8) witness answer. Is there a retainer agreement
- (9) between you and Mr. Jacobs?
- (10) A No.
- (11) Q Are you paying Mr. Jacobs?
- (12) A No, not myself personally.
- (13) MS. KORDZIEL: I'm sorry, are you
- (14) representing Mr. Keene or Cirrus?
- (15) MR. JACOBS: I have been - I'm
- (16) representing Mr. Keene at this deposition, having
- (17) been made available to him as his counsel by Cirrus
- (18) Logic, his former employer, at Cirrus Logic's
- (19) expense.
- (20) Q (By Ms. Kordziel): Okay. What's the
- (21) nature of your relationship with Cirrus Logic
- (22) presently?
- (23) A There is no relationship with Cirrus Logic
- (24) presently.
- (25) Q You're not consulting with Cirrus Logic?

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- (1) A No.
- (2) Q Are you working with Cirrus Logic on this
- (3) investigation in any respect?
- (4) A I have - yeah, I've been giving some advice to
- (5) one of the technical people on this, and - I will
- (6) answer questions on the Cirrus product family.
- (7) Q Can you identify the technical people?
- (8) A Yes. We're answering questions for Richard
- (9) Ferraro only.
- (10) Q It's only questions with respect to Cirrus
- (11) projects or products?
- (12) A The products, right.
- (13) Q Are you answering questions with respect to
- (14) anything else?
- (15) A No.
- (16) Q Have you examined ATI products or technical
- (17) manuals?
- (18) A Nope, never got to see them.
- (19) Q Are you being -
- (20) A I wish.
- (21) Q - compensated for your time for advising
- (22) Cirrus technical people?
- (23) A Yes.
- (24) Q What is the rate of compensation?
- (25) A We've agreed at 150 per hour.

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- (1) Q Were you retained by Mr. Ferraro or by Cirrus
- (2) or counsel?
- (3) A I believe it was initiated by Mr. Ferraro.
- (4) Q When was it initiated by Mr. Ferraro?
- (5) A About three weeks ago.
- (6) Q Is there a letter containing the terms of your
- (7) advisement of Richard Ferraro, for example, your
- (8) rate, or is there a retainer letter?
- (9) A Yes. Without being specific as to the nature
- (10) of the advice, but -- the rate.
- (11) MS. KORDZIEL: Counsel, could we have a
- (12) copy of that retainer letter?
- (13) MR. JACOBS: For what -- what was it
- (14) relevant to in terms of the testimony he's giving you
- (15) today?
- (16) MS. KORDZIEL: He's being compensated for
- (17) his testimony.
- (18) MR. JACOBS: We'll consider your
- (19) request. Just so it's clear, to the extent he's
- (20) being retained through Richard Ferraro as a
- (21) consultant on the case and not being designated as an
- (22) expert, we will be objecting and instructing on work
- (23) product grounds that he not answer questions in that
- (24) area. We understand that his -- that your purpose in
- (25) subpoenaing him or your principal purpose was to ask

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- (1) him factual questions relating to the time when he
- (2) worked on products at issue or --
- (3) MS. KORDZIEL: That's correct.
- (4) MR. JACOBS: Okay.
- (5) MS. KORDZIEL: Although if he was
- (6) retained by Richard Ferraro and not Cirrus counsel,
- (7) though, his work is not work product.
- (8) MR. JACOBS: I think it still is.
- (9) Q (By Ms. Kordziel): At any rate, so
- (10) it's \$150 per hour, is that correct?
- (11) A Yes.
- (12) Q Let's get some background information, starting
- (13) with education. Where did you go to college?
- (14) A At Case Western Reserve University in
- (15) Cleveland, Ohio, and Cleveland State University.
- (16) Q So what was the date at Case Western? When did
- (17) you start?
- (18) A I'd actually have to go back and look at my own
- (19) resume for the right date, because it was '70
- (20) something.
- (21) Q What was your degree?
- (22) A I do not have a degree from Case Western. I
- (23) majored in biomedical engineering.
- (24) Q That's what I majored in undergrad. Do you
- (25) remember when you left Case Western?

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- (1) A After two years of attending.
- (2) Q Where did you go after leaving Case Western?
- (3) A I worked for a couple years, and then I resumed
- (4) college at Cleveland State University, as I said.
- (5) Q Where did you work?
- (6) A Picker X-Ray Corporation.
- (7) Q What sorts of things did you do at Picker
- (8) X-Ray Corporation?
- (9) A I was acting as a technician of repairing,
- (10) calibrating medical diagnostic equipment.
- (11) Q How long were you at Picker?
- (12) A Around two years or less than three.
- (13) Q Where did you go after you left Picker?
- (14) A Cleveland -- Cleveland State University.
- (15) Q Did you get a degree from Cleveland State
- (16) University?
- (17) A No, I did not.
- (18) Q What was your major?
- (19) A There it was electrical engineering.
- (20) Q Why did you decide to leave Cleveland State?
- (21) A At that time, since I had to support myself,
- (22) going to school part-time, and was also doing some
- (23) electrical design work for a small start-up company
- (24) in the area, and started working more and more for
- (25) them, and -- I became the design engineer on several

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- (1) computer projects so that it was full-time work, and
- (2) I was doing what I was going to school for anyway, so
- (3) I just did not complete the last hours necessary for
- (4) a degree, although I had a lot of hours.
- (5) Q Do you remember what year you left Cleveland
- (6) State?
- (7) A Once again, I know the -- the chronology,
- (8) except for the years. So that was like '78 or '9 or
- (9) something. But --
- (10) Q What was the name of the start-up company that
- (11) you went to?
- (12) A It was called Tecmar, T-E-C-M-A-R.
- (13) Q What kind of start-up was it?
- (14) A They were making add-on products for the -- the
- (15) initial personal computer market, originally for
- (16) S-100 bus devices, an ancient thing. And then with
- (17) the introduction of the IBM PC and starting this
- (18) whole PC thing, we introduced some of the very first
- (19) third-party add-on products for the PC.
- (20) Q What are some examples of the third party
- (21) add-on products?
- (22) A A memory and I/O card that extended the
- (23) capabilities of a PC, a video digitizer card, modem,
- (24) later on graphics cards, just --
- (25) Q So you worked on graphics controllers while at

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- (1) Tecmar?
- (2) A Yes.
- (3) Q What was your position at Tecmar?
- (4) MR. JACOBS: At what point?
- (5) Q (By Ms. Kordziel): When he first
- (6) started.
- (7) A Hardware design engineer number one and only.
- (8) Q What were some of the things that you developed
- (9) with respect to graphics controllers while at Tecmar?
- (10) A What -- how do you mean with respect to? How
- (11) far does it go?
- (12) Q Just describe some of your projects with
- (13) respect to graphics controllers there.
- (14) A Tecmar produced several compatible graphics
- (15) devices that worked with the IBM PC architecture, so
- (16) I worked on one, which was the enhancement of what
- (17) was called CGA; worked on introducing an EGA card and
- (18) a VGA card using other companies's devices. Tecmar
- (19) did not develop their own.
- (20) Q What other companies's devices did you use?
- (21) A When we got to the EGA and VGA products, we
- (22) used devices from Genoa Systems and Tseng Labs.
- (23) Q What do you mean when you say you used
- (24) products from Tseng Labs? Did you make further
- (25) developments on Tseng Labs's products, or --

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- (1) A We used Tseng Lab's VGA compatible graphics
- (2) controller and did the rest of the board and product
- (3) design around that. So --
- (4) MR. JACOBS: Tseng Labs provided the
- (5) chip?
- (6) THE WITNESS: Yes. I mean Tecmar built
- (7) board-level products.
- (8) Q (By Ms. Kordziel): I see.
- (9) A So -- yeah. Product design and supporting
- (10) materials.
- (11) Q How long were you at Tecmar?
- (12) A About seven years. It was a long association.
- (13) Q Do you remember the years at all?
- (14) A It was up until just when I moved to
- (15) California, from when I was leaving Cleveland State
- (16) up until -- it was about -- about '89. That's about
- (17) when.
- (18) Q While at Tecmar did you ever consider
- (19) developing a board that had graphics and video
- (20) capability?
- (21) A Not at that time. We did separate products.
- (22) Q You had separate -- separate chips that had
- (23) video and graphics? What did you mean by separate?
- (24) A We had some video products, that was one board,
- (25) and we had graphics products PC. That was a -- a

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- (1) separate board.
- (2) Q While at Tecmar did you ever consider
- (3) overlaying video on graphics?
- (4) MR. JACOBS: Objection, vague and
- (5) ambiguous.
- (6) Q (By Ms. Kordziel): Did you ever
- (7) develop products for working with both your video
- (8) products boards and your graphics products boards?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous.
- (11) Q (By Ms. Kordziel): Excuse me?
- (12) A I'm saying, yes, I --
- (13) Q Yes?
- (14) A I don't understand -- no, I'm saying, yes,
- (15) that's vague. It's too open.
- (16) Q Did you ever work in combining video with
- (17) graphics, using the two boards that you had?
- (18) MR. JACOBS: Objection, vague and
- (19) ambiguous. You can answer. When I object like that,
- (20) you can answer if you understand the question, or you
- (21) can ask for clarification --
- (22) THE WITNESS: Okay.
- (23) MR. JACOBS: -- and answer accordingly.
- (24) THE WITNESS: I don't understand the
- (25) question. I could answer at least something

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- (1) specifically related to it, which is that of course
- (2) the video would have to somehow appear on the
- (3) computer screen, but the combination was completely
- (4) in the realm of software and transferring the data
- (5) from one device to another through the system, and
- (6) was not in the nature of high performance or -- or
- (7) really combining in any direct hardware way.
- (8) Q (By Ms. Kordziel): So it was all
- (9) done with respect to software, like the Microsoft DCI
- (10) spec or something like that?
- (11) MR. JACOBS: Objection.
- (12) THE WITNESS: This was long before any
- (13) specifications existed for these things.
- (14) Q (By Ms. Kordziel): But there was no
- (15) hardware implementation?
- (16) MR. JACOBS: Objection, vague and
- (17) ambiguous.
- (18) THE WITNESS: No hardware implementation
- (19) of what?
- (20) Q (By Ms. Kordziel): Of combining the
- (21) video or of relaying the video on the graphics?
- (22) MR. JACOBS: Objection, vague and
- (23) ambiguous.
- (24) THE WITNESS: Well, there was no
- (25) overlaying of video on the graphics, yes.

- (1) Q (By Ms. Kordziel): I see.
- (2) A In any way.
- (3) Q What was -- I thought you just testified that
- (4) there was some combining of video and graphics. What
- (5) was that then?
- (6) A Combining is not overlaying. Combining was to
- (7) read the data from one card and put it into the other
- (8) cards in a display directly through the system bus.
- (9) Q What was the purpose of that?
- (10) A To see the digitized video.
- (11) Q But there was no overlay of the video then on
- (12) the graphics?
- (13) MR. JACOBS: Objection.
- (14) THE WITNESS: No. Well --
- (15) Q (By Ms. Kordziel): Was there just a
- (16) separate window then for the video? There was
- (17) actually no overlay?
- (18) A There was not even a window for it. It was
- (19) just written as any other graphics data type. It was
- (20) not treated as video.
- (21) Q So it had been converted to graphics format?
- (22) A Yes.
- (23) Q So after Tecmar, where did you go to then?
- (24) A Then I worked for Western Digital out here now,
- (25) moved to California, and it was for the Paradise

- (1) Graphics Group there.
- (2) Q What is the Paradise Graphics Group?
- (3) A That had been a start-up that had developed an
- (4) EGA chip in a VGA device and was acquired by Western
- (5) Digital.
- (6) Q Do you remember what year you were at Western
- (7) Digital?
- (8) A Just when I moved here, which would have been
- (9) about '89. But -- plus or minus a year, because --
- (10) Q What was your position at Western Digital when
- (11) you started?
- (12) A Hardware design manager for VGA graphics
- (13) products.
- (14) Q Can you describe for me some of the projects
- (15) that you worked on while at Western Digital?
- (16) A For the first year, it was managing -- again
- (17) the implementation and board design and product
- (18) support for several VGA board level products using
- (19) Western Digital's VGA controller chip, our -- our
- (20) customers.
- (21) Q Did the Western Digital chips have any video
- (22) capability?
- (23) A No, not at that time, no.
- (24) Q While at Western Digital did you ever consider
- (25) combining video with graphics?

- (1) MR. JACOBS: Objection, vague and
- (2) ambiguous.
- (3) THE WITNESS: To answer it in the
- (4) direction at least for video and graphics in one
- (5) single chip, that was never -- no -- part of the
- (6) product definitions at that time or considerations.
- (7) Q (By Ms. Kordziel): How about
- (8) separately in two different chips?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous.
- (11) THE WITNESS: Western Digital had no
- (12) video digitizer devices or projects, so video was not
- (13) an element of our design.
- (14) Q (By Ms. Kordziel): I see. So while
- (15) you worked at Western Digital, you only worked with
- (16) respect to graphics controllers?
- (17) A The graphics controller was our -- was our
- (18) product.
- (19) Q Did you work with other people's video products
- (20) in combining them with the Western Digital graphics
- (21) controllers?
- (22) MR. JACOBS: While at Western Digital?
- (23) THE WITNESS: No.
- (24) Q (By Ms. Kordziel): So at Western
- (25) Digital there was no concept of using -- overlaying

- (1) video on graphics at that time?
- (2) MR. JACOBS: Objection, vague and
- (3) ambiguous, calls for speculation, lacks foundation.
- (4) THE WITNESS: The concept of video
- (5) overlay was -- was there as -- only considered as --
- (6) called genlocked video, but overlaid as an outside --
- (7) outside, that was the only thing going.
- (8) Q (By Ms. Kordziel): What are some of
- (9) the Western Digital graphics controllers that you
- (10) worked on, the product names?
- (11) A They were all called the Paradise Chip, so
- (12) there was the series of VGA controllers, which had
- (13) product numbers. They don't have any special names.
- (14) Q Other than using genlocked video, were there
- (15) any other methods that you considered in combining
- (16) the videos with graphics?
- (17) MR. JACOBS: Objection, vague and
- (18) ambiguous.
- (19) THE WITNESS: I would say we considered
- (20) what was available and possible at the time, which
- (21) was genlocked, combining it with the output of our
- (22) graphics card using external devices. It was just in
- (23) the nature of demonstration, not for product at all.
- (24) Q (By Ms. Kordziel): What were those
- (25) external devices?

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- (1) MR. JACOBS: Same objection.
- (2) THE WITNESS: I cannot say any specific
- (3) devices because I don't recall us actually producing
- (4) anything, only looking to see if we could be
- (5) compatible with such a method in a general sense.
- (6) Q (By Ms. Kordziel): I see. You
- (7) mentioned demonstrations. Did you have any
- (8) demonstrations, for example, at Comdex?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous.
- (11) THE WITNESS: Do you mean demonstrations
- (12) of video and graphics --
- (13) Q (By Ms. Kordziel): And graphics.
- (14) A -- being combined, Comdex, from Western
- (15) Digital? There was no such thing at that time.
- (16) Q How many years were you at Western Digital?
- (17) A Just a little over two years.
- (18) Q Where did you go after you left Western
- (19) Digital?
- (20) A I spent about one year being self-employed
- (21) again as a consultant, just looking at opportunities,
- (22) and then after about one year, then became employed
- (23) by a different start-up called Acumos.
- (24) Q What technology was Acumos involved in?
- (25) A Producing graphics controller devices,

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- (1) specifically, a highly integrated VGA chip.
- (2) Q Can you describe for me their VGA chip?
- (3) A The first one they produced was the first VGA
- (4) chip that integrated D/A converters and clock
- (5) generators. So it was one single device with memory
- (6) add-on that -- that did the standard VGA required
- (7) functions for PC's.
- (8) Q Was that something new, integrating the DAC
- (9) with the rest of the graphics controller?
- (10) A Yes.
- (11) Q What was your position at Acumos?
- (12) MR. JACOBS: Objection, vague as to time.
- (13) THE WITNESS: Well, I can answer that
- (14) because the time at Acumos was only about a year or
- (15) so before it was acquired by Cirrus Logic. So for
- (16) the time it was actually Acumos, my position was many
- (17) things, being a start-up. So I was the architect of
- (18) the graphics products that we were doing, producing
- (19) register definitions and basic features. I also
- (20) managed the initial software development support and
- (21) the tech support, and the technical aspects of
- (22) marketing.
- (23) Q (By Ms. Kordziel): Did the Acumos
- (24) graphics controller device ever have any video
- (25) capabilities?

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- (1) A No. It was strict VGA.
- (2) Q At Acumos, did you work on combining video with
- (3) graphics?
- (4) MR. JACOBS: Objection, vague and
- (5) ambiguous.
- (6) THE WITNESS: How are you meaning,
- (7) combining video and graphics, in this instance?
- (8) Q (By Ms. Kordziel): For example,
- (9) video overlay.
- (10) MR. JACOBS: Objection, vague and
- (11) ambiguous.
- (12) THE WITNESS: Can you be any more
- (13) specific?
- (14) Q (By Ms. Kordziel): Well, I'm trying
- (15) to just get a background of your work, and so I'm
- (16) trying to be more general here.
- (17) A Well, this is a very general area since there
- (18) are many possible ways to combine video and graphics,
- (19) if you accept limitations.
- (20) Q Well, we already talked about genlocked. Was
- (21) there another way other than genlocked?
- (22) MR. JACOBS: Objection, vague and
- (23) ambiguous.
- (24) THE WITNESS: Was there another way or
- (25) did we consider another way?

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- (1) Q (By Ms. Kordziel): Did you consider
- (2) another way?
- (3) A We only considered enhancing a genlocked type
- (4) external approach.
- (5) Q Was this hardware or software?
- (6) MR. JACOBS: Objection, vague and
- (7) ambiguous.
- (8) THE WITNESS: Well, genlocked is
- (9) specifically hardware.
- (10) Q (By Ms. Kordziel): At that time were
- (11) there other things, like, for example, feature
- (12) connectors to connect the video boards with the
- (13) graphics boards? Did you ever consider using any of
- (14) those?
- (15) MR. JACOBS: Objection, vague and
- (16) ambiguous.
- (17) THE WITNESS: Well, that's not so vague.
- (18) The feature connector's output is the method that can
- (19) be used for genlocked combination externally.
- (20) Q (By Ms. Kordziel): At this time was
- (21) it the advanced feature connector for the VESA
- (22) feature connector that you were using?
- (23) MR. JACOBS: Objection, lacks foundation,
- (24) calls for speculation, vague and ambiguous.
- (25) THE WITNESS: Yeah. At that time that

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- (1) had not yet been defined, so we couldn't use
- (2) something that wasn't existing.
- (3) Q (By Ms. Kordziel): Was this just
- (4) Acumos's internal definition then?
- (5) MR. JACOBS: Objection.
- (6) THE WITNESS: Internal definition of
- (7) what?
- (8) Q (By Ms. Kordziel): You said it
- (9) hadn't been defined, a feature connector of
- (10) connecting a video board with the graphics board.
- (11) A I said the VESA VAVC spec had not yet been made
- (12) as a spec. The concept of feature connector overlay
- (13) was present.
- (14) Q You said you were at Acumos one year when
- (15) Cirrus Logic merged with Acumos or bought Acumos?
- (16) A Bought.
- (17) Q What was your position then?
- (18) A It was still the same position.
- (19) Q What products did you work on, or projects?
- (20) MR. JACOBS: Objection, vague as to time.
- (21) THE WITNESS: Are you asking now about
- (22) Cirrus Logic after Acumos ceased to exist as a
- (23) separate -
- (24) Q (By Ms. Kordziel): Yes, that's
- (25) right.

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- (1) A And for Cirrus Logic, I was the desktop
- (2) graphics products architect. I was responsible for
- (3) the register definition and features for a number of
- (4) desktop graphics devices.
- (5) Q Let's start with the first graphics device
- (6) that you worked on. What was your first project?
- (7) A For - when I was first at Cirrus Logic?
- (8) Q Yes.
- (9) A At that time the main product number is the -
- (10) the first device that was - it was called the 5426.
- (11) Q What was the 5426?
- (12) A That was Cirrus Logic's first VGA device with
- (13) Bit BLT accelerators to enhance Windows's
- (14) performance. Microsoft Windows.
- (15) Q What were some of the key features of the 5426
- (16) other than the Bit BLT?
- (17) A An integrated VGA. It was still a graphics
- (18) device.
- (19) Q The integrated VGA, was that the - did they
- (20) use the same integrated VGA that was developed at
- (21) Acumos?
- (22) A Yes, that's the reason they got Acumos.
- (23) Q What was your next project?
- (24) A I'm trying to consider the sequence because
- (25) there were many.

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- (1) Q Okay.
- (2) A There were many projects discussed and started,
- (3) and with somewhat degree of overlap and parallel. So
- (4) the next significant product direction was adding
- (5) more memory and performance for Windows. So there
- (6) was a 5434 device. It was a 64-bit memory interface
- (7) as opposed to a 32-bit.
- (8) Q Did you work on the 5430?
- (9) A Yes, although its number is smaller, it
- (10) occurred after the 34.
- (11) Q So there's no rhyme or reason for the numbers,
- (12) or is there?
- (13) A There is a rhyme or reason, but it's not
- (14) necessarily obvious from outside.
- (15) Q I see. What's the rhyme or reason? How do you
- (16) number the projects?
- (17) A In Cirrus's case, the 3, designation 3,
- (18) happened to be for devices that supported the PCI bus
- (19) interface, were considered a product family with some
- (20) compatibility that way. The 2 series just supported
- (21) the previous just standard ISA bus, and also the VESA
- (22) local bus - bus standard. And then the second digit
- (23) of 3 something, that then had some correspondence to
- (24) the 1WRE features. So the 30 was a - happened to be
- (25) a 32-bit memory interface, and the 34 was a 64-bit

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- (1) memory.
- (2) Q Why was the 34 developed before the 30?
- (3) MR. JACOBS: Objection, calls for
- (4) speculation, lacks foundation.
- (5) THE WITNESS: Indeed, it would be
- (6) speculation. It's just what we did.
- (7) Q (By Ms. Kordziel): Describe for me
- (8) briefly about the 5434. What were some of the key
- (9) features?
- (10) MR. JACOBS: Objection, asked and
- (11) answered.
- (12) THE WITNESS: What -
- (13) Q (By Ms. Kordziel): You can answer.
- (14) What were some of the features of the 5434?
- (15) A Its features were basically the same as the -
- (16) the 5426, still being a Microsoft Windows 2-D
- (17) accelerator.
- (18) Q So the only difference was the increased
- (19) memory?
- (20) MR. JACOBS: Objection, mischaracterizes
- (21) testimony.
- (22) THE WITNESS: Its differences were
- (23) incremental in a number of areas relating to the
- (24) performance of Windows. The increased memory bus was
- (25) part of that.

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- (1) Q (By Ms. Kordziel): Do you remember
- (2) any other features?
- (3) A Yes, I remember other features. Which ones are
- (4) you asking about?
- (5) Q Just some of the key features.
- (6) A I've already stated the key features.
- (7) Q The increased -- increased memory bus?
- (8) A The main feature was increasing the
- (9) performance, Windows offering higher resolution
- (10) graphics displays, which all required more memory.
- (11) Q What was the next project after the 5434?
- (12) MR. JACOBS: That he worked on?
- (13) Q (By Ms. Kordziel): Yes.
- (14) A Well, hard to say which one was first. The
- (15) 5430 started. There was also a 5425, a TV out VGA
- (16) that was taking place in that period.
- (17) Q What was this time period?
- (18) A The time period -- meaning the date? The
- (19) years?
- (20) Q The year.
- (21) A I'd have to review the -- some of the material
- (22) because it went on -- but I wasn't keeping track of
- (23) that.
- (24) Q Was it early like 1993?
- (25) A As I said, I'd have to look at -- there's dates

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- (1) on materials of Cirrus for the projects we worked on.
- (2) Q I have some of those documents, but I just want
- (3) to get your recollection right now. We'll go more
- (4) into detail on the projects later.
- (5) MR. JACOBS: Objection, calls for
- (6) speculation.
- (7) THE WITNESS: My recollection didn't
- (8) include the specific year, since that wasn't relevant
- (9) to my work, because I was there at the time.
- (10) Q (By Ms. Kordziel): Let's go -- the
- (11) 5425 then, what were some of the key features of the
- (12) 5425?
- (13) A The 5425 was specifically a TV out type of
- (14) device, so it produced its graphics output to be
- (15) displayed on a television set to go to TV encoders
- (16) rather than just for PC's. So it incorporated some
- (17) other features to produce an interlaced video output,
- (18) but to act on that with some flicker reduction.
- (19) Q The 5430, what does that product name stand
- (20) for?
- (21) A The 5430 was another -- that was the -- the
- (22) starting point of that PCI product family, there
- (23) being a 32-bit memory interface.
- (24) Q I thought you said the 5434 was the starting
- (25) point.

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- (1) A Chronologically it was the starting point. In
- (2) features for looking at the family build-up of
- (3) performance levels, the 30 would be the starting
- (4) point.
- (5) Q Describe for me some of the features of the
- (6) 5430.
- (7) A To look at it backwards, its features were
- (8) another VGA device that had 2-D Windows, Microsoft
- (9) Windows acceleration, and a PCI bus interface. It
- (10) had a feature connector, it had the basic graphics
- (11) output.
- (12) Q Was it capable of video overlay?
- (13) MR. JACOBS: Objection, vague and
- (14) ambiguous.
- (15) THE WITNESS: It was capable --
- (16) Q (By Ms. Kordziel): You may answer.
- (17) A You asked if it had any video-related
- (18) capabilities?
- (19) Q Right.
- (20) A It was built to be able to support the then
- (21) emerging VESA VAFC specification for fusing feature
- (22) connector output or input for overlay of external
- (23) video source in a genlocked manner.
- (24) MR. JACOBS: How do you spell
- (25) "genlock"?

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- (1) THE WITNESS: G-E-N-L-O-C-K.
- (2) Q (By Ms. Kordziel): What video
- (3) products or boards was the 5430 used with?
- (4) MR. JACOBS: Objection, lacks foundation.
- (5) THE WITNESS: I don't -- I don't
- (6) understand this question. Which --
- (7) Q (By Ms. Kordziel): It was connected
- (8) to other -- it was connected -- it had capabilities
- (9) for the VESA advanced feature connector? Was it
- (10) connected to -- was it a video port or was it another
- (11) video controller?
- (12) MR. JACOBS: Objection, vague and
- (13) ambiguous.
- (14) THE WITNESS: Video port where? The VESA
- (15) advanced feature connector was the -- the spec just
- (16) for the interface to some other unnamed device that
- (17) provided video output together without --
- (18) Q (By Ms. Kordziel): That's what I was
- (19) asking you. Was there another Cirrus -- you
- (20) mentioned unnamed devices. What devices was it
- (21) connected to? Were there other Cirrus products that
- (22) were developed?
- (23) A Let's see. Specifically then using the -- the
- (24) VAFC designation? Not to my recollection.
- (25) Q So it was not used for the 2070/2080 products?

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- (1) A What was not used?
- (2) Q The 5430.
- (3) A The 5430 could be used with the 2070/2080, but
- (4) that wasn't then covered by the VAFC. It was just a
- (5) company -
- (6) Q That's what I meant -
- (7) A - proprietary -
- (8) Q That's what I meant. What other products could
- (9) it be used with?
- (10) MR. JACOBS: Could you let him finish his
- (11) answer, please?
- (12) Q (By Ms. Kordziel): Yes, I'm sorry.
- (13) A Its connection there was merely Cirrus
- (14) proprietary - the video and the graphics combined
- (15) separately, externally. But it was not part of
- (16) anybody's standard.
- (17) Q Do you remember what year the 5430 was
- (18) developed?
- (19) A Once again, no.
- (20) Q So you don't have any recollections of
- (21) tape-outs or when it was first started to be marketed
- (22) by Cirrus?
- (23) A For a specific year on those, no. I have
- (24) recollection of all the activities, but I just did
- (25) not look - file away the exact date on all of these.

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- (1) Q Did the 5430 use the integrated DAC from
- (2) Acumos?
- (3) A All of the Cirrus graphics products did,
- (4) universally.
- (5) Q So tell me, how was it used with the Pixel
- (6) 2070/2080 products?
- (7) A The 30?
- (8) Q Yes, the 5430. Describe for me the life of a
- (9) pixel or something.
- (10) A Well, once the 5430 would have been used just
- (11) like any other VGA device made by anybody with those
- (12) 2070/2080 devices, since they could accept the
- (13) graphics out of the feature connector and - and try
- (14) to show that, so it wasn't specific to the 5430.
- (15) Q Was the 5430 sold with the 2070/2080?
- (16) MR. JACOBS: Objection, lacks foundation,
- (17) calls for speculation.
- (18) THE WITNESS: What do you mean, sold?
- (19) Q (By Ms. Kordziel): Was it sold as a
- (20) group or -
- (21) A 5430 was sold as a device by itself. It was an
- (22) independent product.
- (23) Q So it was never marketed with the 2070/2080?
- (24) MR. JACOBS: Same objection.
- (25) THE WITNESS: I couldn't answer that.

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- (1) Marketing was - was different than sold.
- (2) Q (By Ms. Kordziel): When the 5430 was
- (3) used with the 2070/2080, what kind of frame buffer
- (4) memory did it have?
- (5) MR. JACOBS: Objection, vague and
- (6) ambiguous.
- (7) Q (By Ms. Kordziel): What kind of
- (8) frame buffer memory was used when the 5430 was used
- (9) with the 2070/2080 combination?
- (10) A The 5430 had a DRAM frame buffer for the
- (11) graphics, contained graphics.
- (12) Q Can you explain to me the functionality of the
- (13) 5430 and how it worked with the 2070 and 2080?
- (14) A Provided the PC and Microsoft Windows
- (15) compatible graphics function for the computer system.
- (16) Q So the 2080 has two input ports, for example,
- (17) one for video and one for graphics. Was the 5430
- (18) connected to the graphics input port of the 2080?
- (19) A Yes, video conferencing application, which
- (20) is -
- (21) Q Is there -
- (22) MR. JACOBS: Wait. Which is -
- (23) THE WITNESS: Which is what the 2070/80
- (24) were constructed for, video conferencing.
- (25) Q (By Ms. Kordziel): Was the 5430

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- (1) connected in any other manner with the 2070/2080
- (2) combination?
- (3) MR. JACOBS: Objection, calls for
- (4) speculation, lacks foundation.
- (5) THE WITNESS: You could say in - in any
- (6) other manner than - than what?
- (7) Q (By Ms. Kordziel): Than going
- (8) through the input port of the 2080.
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous, mischaracterizes his prior testimony
- (11) THE WITNESS: Which part connected and
- (12) how? On a PC board they have -
- (13) Q (By Ms. Kordziel): We had discussed
- (14) earlier the 5430 was connected to the 2080 through
- (15) the graphics input port. Was there ever any other
- (16) considerations of connecting it in any other manner?
- (17) A The graphics output from the 5430 connected to
- (18) that 2080 port, and that was their sole way of
- (19) getting graphics from the 30 to go through the
- (20) 2070/2080 system.
- (21) Q The DRAM frame buffer that was part of the
- (22) 5430, was that a shared frame buffer?
- (23) MR. JACOBS: Objection, vague and
- (24) ambiguous.
- (25) THE WITNESS: That is - that is

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- (1) extremely vague, since "shared frame buffer," the
- (2) term was greatly reused in different aspects. So
- (3) could you be specific as to what you mean by a shared
- (4) frame buffer?
- (5) Q (By Ms. Kordziel): Could it store
- (6) video and graphics data?
- (7) A In different forms?
- (8) Q Yes.
- (9) A No. It stored -- all the data was in the
- (10) format that would be for the graphics display,
- (11) whatever its original source.
- (12) Q So it was only an RGB format?
- (13) A Yes.
- (14) Q Could it store YUV format?
- (15) A And use it directly for anything?
- (16) Q Yes.
- (17) A No.
- (18) Q Did the frame buffer have on-screen or
- (19) off-screen areas?
- (20) A For the graphics it had off-screen like all
- (21) graphics controllers would, more memory than
- (22) sometimes used for just the display.
- (23) Q I'm sorry, you said it had off-screen memory?
- (24) MR. JACOBS: He said --
- (25) THE WITNESS: For the graphics, yes. All

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- (1) the devices, they have more memory than are required
- (2) for just the active graphics display. The rest would
- (3) be called off-screen.
- (4) Q (By Ms. Kordziel): So it had both
- (5) on-screen and off-screen --
- (6) A Graphics memory.
- (7) Q Do you remember whether the 5430 was ever sold
- (8) together with the 2070/2080?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous as to "sold together."
- (11) THE WITNESS: And I would just say how
- (12) Cirrus Logic sold their devices was not part of my
- (13) job function or really any concern, so I couldn't
- (14) say.
- (15) Q (By Ms. Kordziel): Was the 5430
- (16) developed to be used with the 2070/2080?
- (17) MR. JACOBS: Objection, calls for
- (18) speculation, lacks foundation.
- (19) THE WITNESS: Do you mean was it -- it
- (20) was developed to be used as a -- a PC graphics
- (21) accelerator card. Naturally since we made other
- (22) products, we tried to make sure they could work
- (23) together well. But that was -- other than -- than
- (24) working, making sure they functioned together, that
- (25) was the only consideration.

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- (1) Q (By Ms. Kordziel): I see. So part
- (2) of the development, you made sure that the 5430 could
- (3) function with the 2070/2080?
- (4) A Correct, made sure they could be compatible.
- (5) Q Did you work on the 2070/2080 at all?
- (6) A No. They were totally Pixel developments.
- (7) Q So what was the next project? We'll come back
- (8) and do some of these more in detail, but as we're
- (9) going through this progression, what was the next
- (10) project that you worked on at Cirrus?
- (11) A The next major one was developing the 5436.
- (12) Q What was the 5436?
- (13) A It was another 64-bit memory interface, VGA
- (14) graphics accelerator that was compatible with the
- (15) 34. It would seem to have similar features except
- (16) there were a large number of internal improvements
- (17) and redesign to greatly improve the overall
- (18) performance.
- (19) Q It was an improvement over which product? I'm
- (20) sorry, I didn't catch that.
- (21) A The 5434.
- (22) Q What were some of the key features of the 5436?
- (23) A Well, again, its real features were -- in
- (24) this -- in this industry it's just ever-increasing
- (25) just performance measured for -- when benchmarks

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- (1) happen for at that point Microsoft Windows's
- (2) performance. So these features are all
- (3) related to that, performance of accelerating
- (4) graphics.
- (5) Q What kind of frame buffer was used with the
- (6) 5434?
- (7) A You mean what type of memory?
- (8) Q Yes, DRAM --
- (9) A It was a DRAM controller.
- (10) Q Could the 5434 be used with, for example, the
- (11) 2070/2080?
- (12) A Yes.
- (13) Q What was the difference between the 5434 and
- (14) the 5430?
- (15) MR. JACOBS: 5434 and the 5430? In what
- (16) respects?
- (17) THE WITNESS: Well, the main difference
- (18) was -- as I said, the 30 was a 32-bit memory
- (19) interface, the 34 was a 64-bit memory interface.
- (20) Q (By Ms. Kordziel): The 5436 was
- (21) also a 64-bit memory interface?
- (22) A Yes.
- (23) Q What was the difference between the 5436 -- you
- (24) just said there were just improvements in
- (25) functionality over the 5434. Is that correct?

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- (1) MR. JACOBS: Objections, mischaracterizes
- (2) his testimony.
- (3) THE WITNESS: It had many significant
- (4) performance improvements. It had many internal
- (5) design changes. But it was also very compatible in
- (6) registers and functions, so the same -- much of the
- (7) same software could work.
- (8) Q (By Ms. Kordziel): What was the next
- (9) project after the 5436?
- (10) A Well, if we went to the next after that, we
- (11) would miss some projects that were also
- (12) occurring --
- (13) Q Okay.
- (14) A -- In the same time frame as the 36.
- (15) Q Let's go back.
- (16) A So in the same time frame that the 5430, and
- (17) then just slightly later the 36, were happening with
- (18) two different design teams, then at that time the
- (19) 5440 project also was started.
- (20) Q In what stage of the development of the 5430
- (21) project did the 5440 project start?
- (22) A In the development of what? The 30?
- (23) Q Right. Had there already been an architecture
- (24) in place for the 5430 or tape-outs? I was just
- (25) wondering how far along was the 5430 before the 5440

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- (1) started.
- (2) A The 5430 had not yet reached the final
- (3) tape-out, but its register, spec, its basic function
- (4) had been already defined, and a substantial amount of
- (5) design work had been done.
- (6) Q Do you know whether or not the 5430 had already
- (7) been marketed to customers at that time?
- (8) MR. JACOBS: Objection, vague and
- (9) ambiguous.
- (10) THE WITNESS: Can you -- did any
- (11) customers know that we were developing something we
- (12) were calling the 30?
- (13) Q (By Ms. Kordziel): Right.
- (14) MR. JACOBS: Same objection. Could you
- (15) read back the original question, please?
- (16) (The record was read by the reporter as
- (17) follows: "Do you know whether or not the
- (18) 5430 had already been marketed to
- (19) customers at that time?")
- (20) THE WITNESS: Okay. At which time then?
- (21) Q (By Ms. Kordziel): Right before the
- (22) 5440.
- (23) MR. JACOBS: Objection, vague and
- (24) ambiguous.
- (25) THE WITNESS: I have to sort of agree

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- (1) that this is vague, because all of the products that
- (2) Cirrus made are always being talked about to
- (3) customers, telling them future plans.
- (4) Q (By Ms. Kordziel): Okay.
- (5) A Even the product numbers weren't always
- (6) attached to the products at that time. So --
- (7) Q I see. So it was Cirrus's practice to --
- (8) A We were developing new products and talking
- (9) about products to customers, not always specific as
- (10) to what number they may have had applied later.
- (11) Q I see. Were you involved ever in any of these
- (12) discussions with customers?
- (13) A Yes.
- (14) Q Do you recall any with respect to the 5430?
- (15) A Recall just talking about it?
- (16) Q Yes.
- (17) A Only inasmuch as we talked about having a -- a
- (18) PCI bus graphics accelerator chip that was lower cost
- (19) than the 5434, so any market need of having a -- a
- (20) lower cost entry point to a PCI bus compatible
- (21) graphics accelerator --
- (22) Q Do you remember who you talked to in those
- (23) customer discussions?
- (24) A No.
- (25) Q Who were some of Cirrus's main customers?

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- (1) A All those who made PC's.
- (2) Q Do you remember the time frame of the
- (3) discussions of the 5430 with customers?
- (4) A No. Again now we're getting back to
- (5) specifically saying the 30. We didn't discuss the 30
- (6) as a special case with the customers.
- (7) Q But you discussed the --
- (8) A We discussed our product directions often with
- (9) confidentiality with the customers.
- (10) Q Do you remember the time frames?
- (11) A Again, it would have been while we were -- we
- (12) were designing it, just before. So the year again is
- (13) not --
- (14) Q '83 or '84?
- (15) A If those are the years on -- on the material
- (16) here, I --
- (17) Q I'm just asking for your recollection.
- (18) A Again --
- (19) MR. JACOBS: Lacks foundation.
- (20) THE WITNESS: -- my recollection on the
- (21) years wasn't -- wasn't part of my recollection.
- (22) Q (By Ms. Kordziel): You mentioned two
- (23) different design teams. What did you mean by that?
- (24) One design team on the 5430 and another on the 5440.
- (25) or -- I wasn't sure what you were referring to.

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- (1) A That would have been -- Cirrus had a lot of
- (2) engineering resources, so I said there was one group
- (3) of engineer designers that were specifically working
- (4) on the 5436 in one location; there were people
- (5) working on the 30 in a different location still here
- (6) in California. And there was also the -- the people
- (7) in Plano, Texas, that then started working on the
- (8) 5440.
- (9) Q So the 5430 was developed here in California?
- (10) A In Fremont.
- (11) Q And the 5440, that was developed in Plano?
- (12) A The extra features for it, at that point being
- (13) the first device to start doing a -- features
- (14) specifically for video, those parts were done in
- (15) Plano, taking the database from the 5430.
- (16) Q Had you considered using the 5430 and using it
- (17) to combine video with graphics?
- (18) MR. JACOBS: Objection, vague and
- (19) ambiguous as to time, as to "combine."
- (20) THE WITNESS: Or as to "using." What do
- (21) you mean, using? Using it on its own?
- (22) Q (By Ms. Kordziel): Yes. Did the
- (23) idea of the 5440 come from Plano, or the idea of
- (24) combining video with graphics on a single chip?
- (25) MR. JACOBS: Objection, vague and

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- (1) ambiguous.
- (2) THE WITNESS: Okay. Which -- what's the
- (3) question I have before me now? There were two that
- (4) didn't completely --
- (5) Q (By Ms. Kordziel): Let me see if I
- (6) can rephrase that. With respect to the 5430, did you
- (7) and Cirrus in California ever consider combining
- (8) video with graphics on a single chip?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous.
- (11) THE WITNESS: There's so many ways to
- (12) interpret that, so -- you mean -- did we consider
- (13) combining video and graphics on a single chip
- (14) anywhere? Obviously we did since we produced the
- (15) 5440.
- (16) Q (By Ms. Kordziel): That's right.
- (17) A We had to take some device and add those --
- (18) that function to it. At the time that happened, the
- (19) best candidate for that for our schedules was the
- (20) project that was the 5430.
- (21) Q I guess what I'm trying to find out is where
- (22) the idea -- you mentioned the 5440 was developed in
- (23) Plano. Where did the idea come from? Was it Plano
- (24) or California?
- (25) MR. JACOBS: Objection, vague and

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- (1) ambiguous.
- (2) THE WITNESS: I would say where does any
- (3) idea come from? Which part of the idea?
- (4) Q (By Ms. Kordziel): The combining
- (5) video and graphics on a single chip.
- (6) A I really couldn't -- couldn't localize that.
- (7) That was a -- came just -- basic product feature that
- (8) was something we were trying to achieve, just to
- (9) lower the cost of providing video with all the
- (10) requirements.
- (11) Q How did the idea -- well, do you remember when
- (12) the 5440 project started?
- (13) A Well, again it started after the -- the
- (14) development of the 30 and in response to a need for
- (15) improving video playback.
- (16) Q What are some of the features of the 5440?
- (17) A Well, its features were to be able to then
- (18) overlay video -- video on the graphics in a single
- (19) device for the purpose of accelerating Microsoft
- (20) Video For Windows playback, and it had a feature to
- (21) be able to work with a video digitizer device so it
- (22) could input digitized video through the same pins
- (23) that had been the feature connector, to use it as a
- (24) video port, and also be able to display that video
- (25) overlay with the graphics all on the same computer

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- (1) display.
- (2) Q Before the 5440, had there been any development
- (3) regarding overlaying video on graphics in a single
- (4) chip?
- (5) MR. JACOBS: Objection, vague and
- (6) ambiguous as to where.
- (7) THE WITNESS: Yeah, upon -- do you mean
- (8) overlay -- having both the video and the graphics
- (9) data in the same chip and the combination, the
- (10) overlaying of them also in the same chip, and nothing
- (11) coming out except one single -- like analog? I can't
- (12) say video graphics anymore, we don't have enough
- (13) words to be specific, but output to a computer
- (14) display?
- (15) Q (By Ms. Kordziel): Right.
- (16) A There was no such thing.
- (17) Q Did the 5440 have a shared frame buffer?
- (18) A Well, again, how do you mean, a shared frame
- (19) buffer?
- (20) Q Well, how do you define a shared frame buffer?
- (21) A Well, I don't anymore since -- so that's so
- (22) overused as to lose meaning to me.
- (23) Q I guess a frame buffer that stores video and
- (24) graphics data in the native formats, YUV, RGB.
- (25) A The 5440 definitely had graphics in its format

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- (1) of RGB, and video and its format of YUV, and
- (2) different areas of the same supported memory.
- (3) Q Did the frame buffer have on-screen and
- (4) off-screen areas?
- (5) A Yes.
- (6) Q Could it store video in the on-screen areas?
- (7) A In its own format?
- (8) Q Yes.
- (9) A I'm trying to -- I'm trying to recall that.
- (10) It had some -- some feature to display on-screen,
- (11) some versions of video, but not in a YUV form. Again
- (12) so the video is not a precisely defined term, it's
- (13) somewhat -- Video For Windows playback could also be
- (14) in a -- say a Look Up Table format or RGB-16.
- (15) Q But I guess the on-screen areas of the frame
- (16) buffer, could it store video data in its YUV format?
- (17) A And display it that way? No, no.
- (18) Q Could it in any manner?
- (19) MR. JACOBS: Objection, vague and
- (20) ambiguous.
- (21) THE WITNESS: Yes, I -- in any useful
- (22) manner from YUV in the direct on-screen? That's
- (23) not -- that's not its function.
- (24) Q (By Ms. Kordziel): So the frame
- (25) buffer couldn't store YUV data in the on-screen

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- (1) areas?
- (2) MR. JACOBS: Asked and answered.
- (3) mischaracterizes prior testimony, vague and
- (4) ambiguous.
- (5) THE WITNESS: Hmmm?
- (6) MR. JACOBS: Vague and ambiguous.
- (7) THE WITNESS: The first part of your --
- (8) MR. JACOBS: Asked and answered, that
- (9) means the question's already been asked and you've
- (10) already answered it.
- (11) Q (By Ms. Kordziel): But you can go
- (12) ahead and answer it.
- (13) A I guess I have to -- right, I did answer that,
- (14) so it's the same answer, the YUV did not go to the
- (15) on-screen area of the display memory.
- (16) Q So the video data had already been converted to
- (17) RGB before it was stored in the on-screen areas?
- (18) MR. JACOBS: Objection, vague and
- (19) ambiguous.
- (20) THE WITNESS: Well, it's less vague but
- (21) not correct either. It was done so that the YUV data
- (22) would never be converted, it would be put in a
- (23) portion of memory to be displayed.
- (24) Q (By Ms. Kordziel): What portion of
- (25) the memory was it put in?

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- (1) A The off-screen areas.
- (2) Q It was never put in the on-screen areas?
- (3) MR. JACOBS: Objection, vague and
- (4) ambiguous, calls for speculation, lacks foundation.
- (5) THE WITNESS: Say it -- how do we mean,
- (6) put into? It could always be translated by software
- (7) somewhere else and converted to RGB, and then it's in
- (8) the on-screen area. But that's not good performance.
- (9) Q (By Ms. Kordziel): So the frame
- (10) buffer didn't store video data in its YUV format on
- (11) the on-screen areas?
- (12) MR. JACOBS: Objection, vague and
- (13) ambiguous.
- (14) THE WITNESS: Well, that's -- that's been
- (15) answered.
- (16) Q (By Ms. Kordziel): And that's no?
- (17) A The area of the frame buffer did not contain
- (18) YUV formatted data right there in the display part.
- (19) Q In some of the materials that I read, it said
- (20) that the 5440 was developed using technology from the
- (21) 5430 and the 2070/2080 combination. What technology
- (22) was carried over from those products?
- (23) A Well, from the 30, was the entire VGA
- (24) accelerator. It was the whole database of the chip.
- (25) So it was done -- integrated, analog and digital

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- (1) functions, and -- all of it.
- (2) Q What about the 2070?
- (3) MR. JACOBS: Lacks foundation, calls for
- (4) speculation.
- (5) THE WITNESS: I want to say -- what about
- (6) the -- the 2070 and 2080 had to be kind of considered
- (7) as a -- a single -- a single entity, since they have
- (8) functions that only really worked when they were both
- (9) together.
- (10) Q (By Ms. Kordziel): Okay. Why is
- (11) that? Why did they have to be considered as a single
- (12) entity? Why didn't the functions work?
- (13) A The 2070 and 2080 were just -- they had an
- (14) overall function for video conferencing, but you
- (15) couldn't really use one part of it just by itself.
- (16) They were designed to work closely together. So they
- (17) weren't really separable as separate products.
- (18) Q I see. They were developed to work together,
- (19) and then marketed to customers as one combination
- (20) product --
- (21) A Together.
- (22) Q -- is that correct?
- (23) A Yes.
- (24) Q Okay. So then from the 2070/2080 combination,
- (25) what was carried over into the 5440?

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- (1) MR. JACOBS: Objection, calls for
- (2) speculation, lacks foundation.
- (3) THE WITNESS: Well, okay. I could answer
- (4) the -- since those were the products of Pixel, and
- (5) they contained functions for processing YUV video
- (6) information, at least in the general sense, there was
- (7) already the experience of doing the color space
- (8) conversion there.
- (9) Q (By Ms. Kordziel): What else? What
- (10) else was carried over from the 2070/2080?
- (11) MR. JACOBS: Objection, mischaracterizes
- (12) prior testimony, lacks foundation, calls for
- (13) speculation.
- (14) MS. KORDZIEL: Counsel, please keep your
- (15) objections to the short form.
- (16) MR. JACOBS: That's pretty short.
- (17) THE WITNESS: Well, at that point, any
- (18) more specifics could only be answered by the people
- (19) who did the 2070/2080. Since I didn't design them or
- (20) specify them, any more specific -- it was within
- (21) their knowledge, not mine.
- (22) Q (By Ms. Kordziel): So you didn't
- (23) design the architecture for the 5440 then?
- (24) A That's essentially correct. Well, which --
- (25) well, what part of the 5440?

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- (1) Q Well, what part did you design?
- (2) A Since I defined the 5430 and all of its
- (3) function, and that was carried over exactly the same
- (4) into the 5440, therefore, I did that part of it,
- (5) which was all the --
- (6) Q I see.
- (7) A -- basic 2-D graphics capabilities.
- (8) Q So then I guess you did design -- you did
- (9) design the architecture of the 5440 with respect to
- (10) the 5430? Is that --
- (11) MR. JACOBS: Objection.
- (12) Q (By Ms. Kordziel): Is that what you
- (13) were saying?
- (14) MR. JACOBS: Objection, mischaracterizes
- (15) prior testimony.
- (16) THE WITNESS: I said that for all of the
- (17) basic graphics functions of just 2-D, they were
- (18) identical in spec.
- (19) Q (By Ms. Kordziel): But the video
- (20) functions, were you involved in the architecture for
- (21) the video functions, or was that all in the
- (22) 2070/2080?
- (23) A That's two different questions or something.
- (24) Q Okay. Let's take the first question then.
- (25) Were you involved in designing the architecture with

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- (1) respect to the video portions of the 5440?
- (2) A Okay. What is your -- your interpretation of
- (3) "involved"? I mean I was the architect of products
- (4) so I talked to all the engineers on things. But --
- (5) so --
- (6) Q I guess -- I thought you had said that you were
- (7) the architect of the 5430, and so since that was
- (8) carried over in the 5440, you were the architect of
- (9) the graphics portions. So I was wondering about the
- (10) video portions.
- (11) A And that's why I'm saying, how much do you
- (12) mean, involved? Inasmuch as just talking about
- (13) things, discussing them at brainstorming sessions
- (14) early on, I participated. When it was -- then the --
- (15) the actual architecture of that implementation, I was
- (16) not directly involved at that point. That was done
- (17) in Plano.
- (18) Q In those discussions, you don't remember
- (19) discussions pertaining to the 2070 and 2080 and what
- (20) portions were carried over?
- (21) MR. JACOBS: Objection, compound.
- (22) THE WITNESS: Well, I could specifically
- (23) say when we were talking about video features there,
- (24) we didn't talk in terms of the 2070/2080. They
- (25) weren't part of the discussion at that time.

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- (1) Q (By Ms. Kordziel): What were the
- (2) unique features of the 5440 that weren't found in the
- (3) 5430 or the 2070/2080 combination?
- (4) A Well, okay. If we want to compare the 40 to
- (5) the 30, it specifically had this thing we called the
- (6) back end video that was able to provide the overlay
- (7) video from a different area of the same memory that
- (8) the chip used and combine it and overlay it on the
- (9) graphics.
- (10) And it had also a video input port as a
- (11) separate way of getting video data into that same
- (12) memory for overlay combination, which the 30 didn't
- (13) have as a function. As opposed to the 2070/2080, it
- (14) was a single device that combined all together
- (15) instead of being many devices.
- (16) Q Does the 2070/2080 combination -- that has a
- (17) back end video; is that correct?
- (18) MR. JACOBS: Objection, calls for
- (19) speculation, lacks foundation.
- (20) THE WITNESS: The way we called the back
- (21) end video was -- that way was kind of specific to
- (22) doing the video processing and the final stage in the
- (23) same graphics device, so -- something like that
- (24) wasn't relevant to the 2070/80. They were only --
- (25) that was only a video device, for one thing.

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- (1) Q (By Ms. Kordziel): That's right.
- (2) I'm just --
- (3) A So we had no back or front end per se, it only
- (4) processed video streams relative to teleconferencing
- (5) applications.
- (6) Q The 2070/2080 also had a video input port. Is
- (7) that correct?
- (8) A That's -- where do you mean that? That was not
- (9) exactly correct, but --
- (10) Q It didn't have a video port?
- (11) A Are you asking a video port in the sense that
- (12) the 5440 had a video capture port, or just that it
- (13) had something called --
- (14) Q Just that it had a video port. Could you input
- (15) video?
- (16) A It didn't have a video port. It was a video --
- (17) the 2070 was a video processing device. So it would
- (18) be built in a system with a video digitizer or more
- (19) -- and the output from that would be used by the 2070
- (20) on the same board.
- (21) So a port is usually intended to mean its
- (22) interface to another device that's on a separate
- (23) board somewhere else.
- (24) Q Did the 2080 have a video port?
- (25) A The 2080 was the DAC portion of it, which could

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- (1) accept the video data through one set of pins and
- (2) graphics data through a different set of pins.
- (3) combine them. So it had no ports. It was -- it just
- (4) had an interface.
- (5) Q I'm just trying to understand your distinction,
- (6) because you had said that the 2070 and 2080 had the
- (7) back end video --
- (8) A No, I never said that.
- (9) Q Oh, you said that the 5440 combined all those
- (10) in a single -- the video, the back end video and the
- (11) video input port in a single device. Is that
- (12) correct?
- (13) A I said that the 5440 had the video port and the
- (14) video back end processing playback as an enhancement
- (15) relative to the 5430. Relative to the 2070/2080, it
- (16) combined video and graphics and the output and the
- (17) overlaying, all of that into one single device, not
- (18) saying about the video part.
- (19) MR. JACOBS: Could we -- it's been an
- (20) hour-and-a-half.
- (21) MS. KORDZIEL: Sure, that's fine. Let's
- (22) take a break. We'll go off the record.
- (23) (A recess was taken.)
- (24) Q (By Ms. Kordziel): Let's go back on
- (25) the record.

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- (1) Before we left, I think you were
- (2) enumerating the unique features of the 5440 as to the
- (3) 5430 and the 2070/2080 combination. I think you
- (4) mentioned the back end video, the video input port
- (5) and single device. Are there any other features?
- (6) A Any other features --
- (7) Q Unique to the 5440.
- (8) A That's not enough? After that, anything
- (9) that -- were not relevant functions between them, so
- (10) they weren't the same devices either, so --
- (11) Q But what were other unique features of the 5440
- (12) in general?
- (13) A If we were comparing the 5440 to other VGA
- (14) chips mainly, then I've already stated its unique
- (15) features, which were trying to do the video overlay
- (16) display in a new way for better performance. And
- (17) that was its unique feature.
- (18) Q What about the frame buffer? Would that be a
- (19) unique feature of the 5440?
- (20) A What about -- how do you mean, what about the
- (21) frame buffer?
- (22) Q Having the shared frame buffer concept.
- (23) A That was part of how it displayed the video as
- (24) an overlay, so that was an aspect of its uniqueness.
- (25) the video.

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- (1) Q We'll come back, but let's move on. What other
- (2) projects were going on at this time?
- (3) MR. JACOBS: Objection, vague as to time.
- (4) THE WITNESS: At the time of the
- (5) development of the 40?
- (6) Q (By Ms. Kordziel): Right, because I
- (7) guess we were talking earlier about the 5430, and you
- (8) had said at the same time frame there was the 5440.
- (9) Were there some other projects going on?
- (10) A There were a lot of projects going on. Can we
- (11) narrow this down to projects I was working on,
- (12) projects that were just in the Cirrus desktop
- (13) graphics group or --
- (14) Q In desktop graphics.
- (15) A Just for the desktop graphics group, there was
- (16) the 30 and the 36, as I said, in development, and
- (17) then the 40 as an extension of the 30 using
- (18) engineering resources in Plano, Texas. And some of
- (19) the last parts of the 5425 project were still
- (20) continuing or being completed at that time. So that
- (21) would have been basically all the projects for the
- (22) desktop graphics.
- (23) Q What else did you work on after the 5440?
- (24) A Okay. After the 40, then we developed the 5446
- (25) device. So it actually had a logical reason for its

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- (1) number because it was a 4, because it was a video
- (2) accelerator display improvement device like the 40
- (3) with not video overlay features. It had the 6,
- (4) because then like the 36, it was another - same
- (5) 64-bit memory interface features, graphics
- (6) accelerator.
- (7) So the 5446 had the video features of the
- (8) 40 with continuing improvements, and all of the
- (9) graphics and basic Windows accelerator features of
- (10) the 5436.
- (11) Q The products from the 544-X and the 543-D,
- (12) they're considered part of the Alpine family?
- (13) A That's correct.
- (14) Q Is the 542-X, was that part of Alpine or not?
- (15) A I think I recall the Cirrus products - it was
- (16) when they started calling the - the 3 and 4-X the
- (17) Alpine. I - I don't think they used that term on
- (18) the 2-X family, but I'm not positive.
- (19) Q After the 5446, what project was after that
- (20) that you worked on?
- (21) A At that point there were fewer - well, there
- (22) were probably side branches, but the next direct
- (23) product was the 5480.
- (24) Q What was the 5480?
- (25) A The 5480 was a synchronous DRAM version of the

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- (1) 5446. As usual, more - more features in general,
- (2) just refinements.
- (3) Q What was the advantage of using a synchronous
- (4) DRAM rather than just the DRAM?
- (5) A More performance, more memory, more band width.
- (6) Q You mentioned some side branches. What were
- (7) you referring to there?
- (8) A There were other things called - there was a
- (9) device called the 54-M-40, so there were just some
- (10) permutations there with some small enhancements. I
- (11) don't really recall what they were.
- (12) Q After the 5446, what then?
- (13) A After the 46 was the 80.
- (14) Q I'm sorry, after the 5480?
- (15) A For that particular product family, that was
- (16) the end of its line.
- (17) Q What about the next product family?
- (18) MR. JACOBS: That he worked on?
- (19) THE WITNESS: How do you mean next?
- (20) Chronologically or -
- (21) Q (By Ms. Kordziel): What did you work
- (22) on next?
- (23) A After the 80, I was not - no longer directly
- (24) with Cirrus Logic anymore, since the 80 became the
- (25) end of its - this Alpine family. I had been working

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- (1) on a preliminary functional spec for what would have
- (2) been a successor part to it, which might have been
- (3) called the 5482, but that never became an actual
- (4) product. And at that point I was not a direct
- (5) employee of Cirrus, I already had left, but was still
- (6) acting as a consultant and working on just the spec
- (7) for this possible follow-on device that got killed.
- (8) Q When did you leave Cirrus?
- (9) A At this point now it would be just a little
- (10) under three years ago.
- (11) Q End of '95?
- (12) A Yeah. Yeah. I mean the last official time I
- (13) was an employee would have been about December of
- (14) like '95.
- (15) Q But you were still working on this 5482. What
- (16) did the 5482 do? What were the features?
- (17) MR. JACOBS: Assumes facts not in
- (18) evidence.
- (19) THE WITNESS: Well, that - it wasn't a
- (20) device, it was just a - it was another increment
- (21) above the 5480. So I would say we didn't get - it
- (22) did not go on far enough to really distinguish it,
- (23) because it didn't have a complete and final spec,
- (24) hadn't been started, and we couldn't say what it did
- (25) because it never ended up doing anything.

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- (1) Q (By Ms. Kordziel): When you were
- (2) consulting, did you consult with other companies, or
- (3) was Cirrus your main customer?
- (4) MR. JACOBS: Objection, vague as to time.
- (5) THE WITNESS: If you mean immediately
- (6) after my official departure from Cirrus, for about
- (7) the next eight-month period, it was still only Cirrus
- (8) Logic.
- (9) Q (By Ms. Kordziel): Why did you
- (10) decide to leave Cirrus?
- (11) A Because I was tired of 70-hour weeks; because
- (12) since I had been part of Acumos, and that start-up, I
- (13) did reasonably well financially from the acquisition
- (14) by Cirrus, and stock options, and so I was secure
- (15) enough that I didn't have to be working full-time.
- (16) So I was looking into other -
- (17) Q Must be nice.
- (18) A - other areas to work and do things, and so I
- (19) left to not work for any place full-time again.
- (20) Q Who were some of your other customers that you
- (21) consult with or consult for?
- (22) A Currently?
- (23) Q Yes.
- (24) A At the present time, I'm doing work for a
- (25) company, Paradise Electronics, producing a chip for

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- (1) flat panel display monitors, an enhancement. And I'm
- (2) doing some consulting work for a company called
- (3) Gigapixel. They develop 3-D accelerator pieces
- (4) they're trying to offer as design information IP.
- (5) I'm working for them on defining a 2-D accelerator
- (6) portion to go with their design database.
- (7) Q Anybody else?
- (8) A At the present time, no.
- (9) Q Other than the work that you're doing with
- (10) Richard Ferraro, are you consulting with Cirrus on
- (11) other matters?
- (12) A I haven't had any involvement of any sort with
- (13) Cirrus for more than a year-and-a-half.
- (14) Q That was after when you stopped working on the
- (15) 5482 functional spec?
- (16) A Right. That was one of the last things I did.
- (17) Q Did you work -- while at Cirrus did you ever
- (18) work on the Laguna family of products?
- (19) A No, I did not work on it. That was a different
- (20) group.
- (21) Q Who was in your group?
- (22) A You mean the names of people?
- (23) Q Yes, the names of people.
- (24) A Well, okay. I'd have to define what my group
- (25) is, because that's not the same as some of the design

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- (1) teams.
- (2) My group was just the desktop
- (3) architecture part, which also covered competitive
- (4) analysis of similar devices, and also tuning the
- (5) performance of the same devices. So it was -- so the
- (6) people in my group then had -- didn't directly do any
- (7) of the design for any of these products. So I could
- (8) name them, but they -- probably their names aren't
- (9) even on any of the materials that are around.
- (10) Q So you were the only one in your group to
- (11) actually work on the design for the 5430 and the
- (12) 5440?
- (13) A Well, again, I didn't specifically work on the
- (14) design. I worked on the functional definition, the
- (15) overall architecture. So people in my group then
- (16) helped to contribute to that also, and they were also
- (17) at least indirectly participating in that.
- (18) Q I see.
- (19) A But --
- (20) Q Why don't you give me some of the names of the
- (21) people who worked in your group then?
- (22) A The main person that helped me was a Bob
- (23) Rutkowski, R-U-T-K-O-W-S-K-I. And then there was a
- (24) person named Scott Ruan, R-U-A-N. So those were the
- (25) main two people for the time -- there were some other

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- (1) technicians and others that helped with different
- (2) parts, but --
- (3) Q Were you the manager of this group?
- (4) A Yes.
- (5) Q Throughout your time at Cirrus, were you always
- (6) the manager of this group? Did you ever change to
- (7) another group?
- (8) A I'm pausing on that because it wasn't quite so
- (9) clearly defined. These things were very amorphous.
- (10) So I was always responsible for the desktop graphics
- (11) architecture.
- (12) I had a group that -- basically that was
- (13) a fairly continuous core of that, the two people that
- (14) were there, that Bob Rutkowski was doing much of the
- (15) software analysis specifically for Microsoft Windows
- (16) acceleration and helping on tuning drivers, and Scott
- (17) helped a lot for competitive analysis of other
- (18) graphics products when we were also looking at
- (19) benchmark performance and tuning.
- (20) Q The competitive analysis, what products did you
- (21) analyze?
- (22) A Just about all other VGA devices. We were
- (23) looking at why somebody gets a certain score in a
- (24) benchmark for Windows, and we may have a different
- (25) one, so we looked at products from -- I mean board

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- (1) products from S-3, from Tseng Labs, from ATI, of
- (2) course.
- (3) Q Which ATI products did you examine?
- (4) A During that time frame, probably started with a
- (5) product called the Mach-32 through the Mach-64.
- (6) Basically that product family up to when the 3-D
- (7) acceleration started to be incorporated in other
- (8) devices. So we didn't look at the 3-D accelerators.
- (9) Q What about S-3? Do you remember what products
- (10) you looked at?
- (11) A Well, again a large number, but specifically
- (12) things like the Trio of 64, and I guess whatever
- (13) names they put just before and just after that
- (14) device. It was just before S-3 integrated some DAC
- (15) functions. The Trio was one of their first
- (16) integrated VGA devices.
- (17) Q What about Tseng, do you remember what products
- (18) you looked at?
- (19) A There was the ET-3000 mostly.
- (20) Q Any other companies?
- (21) A Yeah. I guess -- all -- Trident had parts, so
- (22) they were also a competitor in areas to really look
- (23) at. I don't really recall their product numbers.
- (24) There were many other players.
- (25) Sometimes we would have one or two -- one

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- (1) device we might see, so very small start-ups, too, we
- (2) looked at, which I don't recall their names. There
- (3) were companies like Oak, but they -- they somewhat
- (4) faded from the graphics area during that same time
- (5) frame, so we looked at a lot fewer of their devices.
- (6) They were much less of a competitor.
- (7) Q I see. Do you remember which Oak products you
- (8) looked at?
- (9) A No, because they were not very significant.
- (10) Q Do you remember the Spitfire or the Oak -- the
- (11) OTI-107?
- (12) A I recall those numbers, but not as anything we
- (13) ever looked at at that point. Those were later.
- (14) Q Did you only look at controllers? Did you
- (15) look at DACs, like, for example, the Brooktree DAC or
- (16) other types of products?
- (17) A We looked at graphics controller devices,
- (18) cards that we had that were competitors to our
- (19) graphics products. So some of those didn't have an
- (20) integrated DAC on them, so -- but then we didn't pay
- (21) attention to where that came from.
- (22) We were merely using the standard
- (23) compatible VGA RAM DAC that was supplied by a number
- (24) of companies, Brooktree among them.
- (25) Q So you didn't really pursue that area, just the

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- (1) controller aspects?
- (2) A Correct.
- (3) Q In performing your competitive analysis, what
- (4) sorts of things did you look at?
- (5) MR. JACOBS: Objection, vague and
- (6) ambiguous.
- (7) THE WITNESS: I would say that was
- (8) specific enough, because we did our analysis on the
- (9) performance of that device relative to memory -- to
- (10) the system interface efficiency, to the memory
- (11) performance and all relative to how they did graphics
- (12) acceleration. So we looked at their interface to the
- (13) DRAM and their interface to the host bus, and again
- (14) tried to -- to guess as to how they might function
- (15) internally and how they were doing their Windows
- (16) acceleration.
- (17) Q (By Ms. Kordziel): Where did you get
- (18) this information from?
- (19) A We -- which information?
- (20) Q You had mentioned the interface. Did you get
- (21) this information from technical manuals, for example,
- (22) or did you buy the chips?
- (23) A We got the boards that had the chips on them.
- (24) We plugged them into systems, ran their standard
- (25) software that came with that, and using a logic

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- (1) analyzer and other tools, examined the behavior of
- (2) these things. We used any other material that was
- (3) publicly available.
- (4) Q After obtaining the information, what did you
- (5) do with the information?
- (6) A The information on how these things performed?
- (7) Q Right.
- (8) A In some instances we used part of it just to
- (9) prepare a report to show performance of other devices
- (10) relative to ours, so that the marketing people at
- (11) Cirrus would have a frame of reference for their
- (12) materials.
- (13) In other instances we used this to try to
- (14) look at possible ways to improve our own performance.
- (15) Q So did you ever reverse-engineer any of the
- (16) products?
- (17) MR. JACOBS: Objection, vague and
- (18) ambiguous.
- (19) THE WITNESS: As I stated, we attempted
- (20) to try to at least make good guesses as to how they
- (21) achieved some level of performance. That was a long
- (22) way from truly reverse-engineering things. We
- (23) weren't concerned with exactly how they achieved
- (24) something, but just to see what they were doing,
- (25) mostly also to separate software enhancements from

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- (1) actual hardware. Since benchmarks are a mix of
- (2) software tweaks and real hardware performance, we
- (3) tried to determine which was the real contribution.
- (4) Q (By Ms. Kordziel): How did you use
- (5) that information in the development of Cirrus
- (6) products?
- (7) MR. JACOBS: Objection, vague and
- (8) ambiguous.
- (9) THE WITNESS: I guess I would say can you
- (10) give me -- can you be more specific as to how you
- (11) mean that question, because information is used in a
- (12) variety of ways.
- (13) Q (By Ms. Kordziel): I think you
- (14) mentioned earlier that you used the information for
- (15) marketing purposes, and then I believe you said
- (16) something -- you used it for development of products
- (17) or improving Cirrus products. I just wanted to find
- (18) out more information about that.
- (19) A Well, this was always in regard to like our
- (20) benchmark performance or looking at things where we
- (21) might then notice that a particular part of a
- (22) benchmark, one of the sort of subtests might be a
- (23) higher competitor device than ours. That might help
- (24) us to look at our own software, hardware, and find
- (25) out that there was something that we could improve

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- (1) that we hadn't started before. There's so many
- (2) places that are possible for improvement.
- (3) Q Did you try to figure out how the competitor
- (4) made that improvement or how the competitor's device
- (5) worked?
- (6) A As I said, yes, we tried to make a good guess.
- (7) Otherwise if we didn't have some understanding of it,
- (8) we couldn't know how to do anything ourselves towards
- (9) that.
- (10) Q Did you ever use that information in the
- (11) development of your products?
- (12) A As I said, parts of it gave us ideas, we looked
- (13) at it just in general, but most often it was more to
- (14) see that we were doing something different than the
- (15) other ones did, and at least just to be able to -
- (16) to - and illustrate our differences to customers
- (17) between our products and other devices.
- (18) Q What other projects did your group, desktop
- (19) graphics, work on, other than competitive analysis?
- (20) A What other project?
- (21) Q Or other purpose. What's another -
- (22) A Well, my group was the architecture for the
- (23) desktop graphics, so we arrived at the spec for those
- (24) products and the architecture from analysis of
- (25) competitor products, from talking to customers, and

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- (1) working with the engineers. So that was what we did.
- (2) Q But you said you didn't work on the Laguna
- (3) family of products?
- (4) A Correct. The Laguna family was then another
- (5) product line of Cirrus that came in later from other
- (6) acquisition people, so some of that were some people
- (7) in Fremont plus also this Bellevue office and even
- (8) parts of something from Texas when they incorporated
- (9) some 3-D functions.
- (10) So the Laguna family was called a
- (11) different family of chips, and that wasn't even
- (12) called at that point the desktop graphics. I think
- (13) it was labeled Professional Graphics at that point.
- (14) Q I see. When I read desktop graphics, I thought
- (15) Laguna was a desktop product. That's why I assumed
- (16) it would have been under your -
- (17) A You must have, but at that point Cirrus was
- (18) working in several directions sort of at the same
- (19) time, and later the Laguna was the last family, was
- (20) the last product still being developed on which
- (21) Cirrus still had the graphics products. The Alpine
- (22) family had been sort of stopped, while there was
- (23) still only a Laguna device being produced.
- (24) Q When was the Alpine family stopped?
- (25) MR. JACOBS: Objection, vague and

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- (1) ambiguous.
- (2) THE WITNESS: Oh, all I can say is just
- (3) back what I had said previously, the 5480 was the
- (4) last product developed in that family. So further -
- (5) further additions to that family stopped after that.
- (6) We continued to sell the chip, though, the 5480. As
- (7) far as I know that still could be purchased.
- (8) Q (By Ms. Kordziel): Okay. Are you
- (9) familiar with the Laguna family of products?
- (10) A Yes.
- (11) Q But you didn't do any work on them?
- (12) A Right. Right. I could explain that with
- (13) Cirrus, there were sort of three somewhat separate
- (14) areas for the PC graphics in general. There was the
- (15) laptop group, specifically worked on the low power
- (16) group graphics things for LC display. There was -
- (17) at that point called the desktop graphics, which was
- (18) all of these products that came from Acumos, sort of
- (19) parentage; and then later there was this Laguna
- (20) family that came from a completely different original
- (21) source.
- (22) Q Do you know where the Laguna family came from,
- (23) what source?
- (24) A Its core VGA parts and other functions came
- (25) from the division that was in Washington, Bellevue.

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- (1) I don't recall the name of the company that kind of
- (2) got merged into that, but - and Laguna was a RAM bus
- (3) product family.
- (4) Q Do you know what some of the other key features
- (5) of the Laguna family are?
- (6) A The first part of the Laguna family, the only
- (7) really specific distinguishing feature was that it
- (8) was constructed for using RAM bus memory, which
- (9) required very different interfacing technology than
- (10) all the other graphics chips that used DRAM. And
- (11) even synchronous DRAM is much closer to DRAM than RAM
- (12) bus is.
- (13) Q Did any of the product features from the
- (14) Alpine family carry over to the Laguna family?
- (15) A Indeed, yes, in the - I guess what was the
- (16) last product introduced in the Laguna family that
- (17) became a product for sale and is still available, the
- (18) 5465, that one received the video processing video
- (19) back end function that essentially came from the
- (20) 5480.
- (21) The previous two Laguna chips did not
- (22) have this kind of video feature.
- (23) Q What were the two prior Laguna chips?
- (24) A There was a 5462, that was the first - the
- (25) first one done for the Laguna. Had no 3-D, it was a

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- (1) RAM bus basic VGA Windows accelerator.
- (2) Q Did it have a shared memory?
- (3) A Well, see, again, this shared memory. It
- (4) had - it tried to do some features for video, but it
- (5) was all prophecy on what we call front end video.
- (6) Q Did the 5462 have back end video?
- (7) A No.
- (8) Q What kind of frame buffer did the 5462 have?
- (9) A How do you mean, what kind?
- (10) Q Was it a DRAM, a synchronous DRAM, a RAM bus?
- (11) A I said -
- (12) Q They were all RAM bus?
- (13) A They were all RAM bus.
- (14) Q Okay.
- (15) A That was universal for - anything with Laguna
- (16) used RAM bus.
- (17) Q Could that RAM bus store video and graphics
- (18) data in the YUV and RGB formats?
- (19) A It could certainly store the data in any
- (20) format. Do you mean - it could be put there. It
- (21) had a front end video processing that used its
- (22) Bit BLT engine to read YUV data from one part of the
- (23) memory and then try to process it and put it back
- (24) into the display area of the memory, convert it to
- (25) RGB. So that's why we call it front end.

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- (1) Q Once it was put back into the display memory,
- (2) it went to the digital analog converter and then out
- (3) to the display, so there was no back end processing?
- (4) A Right. At that point, only RGB data came
- (5) through its output pipeline.
- (6) Q In reading some of the Cirrus materials, are
- (7) you familiar - I came across the concept of tag
- (8) memory. Are you familiar with that concept?
- (9) A Where did you see it, because again, that's -
- (10) at least that phrase could be used several places.
- (11) Q I guess tag memories were the - the memory is
- (12) tagged so that it could be read out as video graphics
- (13) data, so its tag identifies it as to whether it's
- (14) video or graphics.
- (15) A Do you mean this in the context of the Laguna
- (16) products? At that time there was a 9-bit version of
- (17) RAM bus, so specifically as to a special version of a
- (18) RAM bus memory, they attempted to do something so the
- (19) ninth bit would be used as some sort of
- (20) distinguishing mark between how to interpret the rest
- (21) of the eight bits on there - calling it - relating
- (22) to video or relating to graphics. They had lots of
- (23) limitations.
- (24) Q Was this tagging done before the front end
- (25) pipeline? Where was the addressing done on the data?

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- (1) MR. JACOBS: Objection, vague and
- (2) ambiguous. What context are you talking about?
- (3) MS. KORDZIEL: The 5462.
- (4) THE WITNESS: Okay. How do you mean, the
- (5) address of which data?
- (6) Q (By Ms. Kordziel): Well, this
- (7) 9-bit. I assume that occurred before the front end
- (8) video processing. How is it read out of the memory?
- (9) MR. JACOBS: Objection, vague and
- (10) ambiguous. Are you sure you mean the 5462?
- (11) THE WITNESS: Yes, the 5462, 9-bit RDRAM
- (12) was just - the whole nine bits were there for all of
- (13) the memory addresses. The ninth bit wasn't any
- (14) special location. So when the front end video
- (15) would - would write into the display area memory,
- (16) some part of that, it would also be able to write the
- (17) ninth bit at the same time it wrote the other eight
- (18) bits. Then that bit could be read out of the single
- (19) pipeline that it had going out to the display to use
- (20) that bit to make some very limited choices as to what
- (21) to do with the other eight bits.
- (22) Q (By Ms. Kordziel): Other than the
- (23) 5462, what was the other Laguna product?
- (24) A There was the 5464.
- (25) Q What was the difference in that?

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- (1) A The 5464 added some 3-D acceleration features.
- (2) Q Did it also have the 9-bit version of RAM bus
- (3) so that there was tagged memory?
- (4) A That functionality was still there, since it
- (5) had been in the 62.
- (6) Q How is that different from the Alpine family of
- (7) products?
- (8) MR. JACOBS: Objection, vague and
- (9) ambiguous.
- (10) THE WITNESS: Yeah, how is -
- (11) Q (By Ms. Kordziel): The tagged memory
- (12) structure.
- (13) A In the Alpine family being regular DRAM, there
- (14) wasn't any such thing, so different in that it didn't
- (15) exist in any way at all in the Alpine family.
- (16) Q How is video data distinguished from graphics
- (17) data then in the Alpine?
- (18) MR. JACOBS: Objection, vague and
- (19) ambiguous, assumes facts not in evidence.
- (20) THE WITNESS: I think I would say how do
- (21) you mean in this instance, distinguished? At what
- (22) point of the process do you mean that?
- (23) Q (By Ms. Kordziel): When it was read
- (24) out, how did the device know whether or not it was
- (25) reading out graphics data versus video data?

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- (1) MR. JACOBS: Objection, vague and
- (2) ambiguous.
- (3) THE WITNESS: It had -
- (4) MR. JACOBS: Assumes facts not in
- (5) evidence.
- (6) THE WITNESS: I would make that - my
- (7) response specific that it read - it was constructed
- (8) to read the video from one area of the common memory
- (9) and the graphics from a different area under the
- (10) control of registers that specified the starting
- (11) address, and then size and positional information.
- (12) Q (By Ms. Kordziel): From the starting
- (13) address it just read it sequentially?
- (14) MR. JACOBS: Objection, same objection,
- (15) vague and ambiguous.
- (16) THE WITNESS: "It" being the video or
- (17) the - from a starting address, either the video or
- (18) the graphics would be read at least from contiguous
- (19) addresses for at least one - one line of the video.
- (20) Q (By Ms. Kordziel): Okay. You
- (21) mentioned that the video data was stored in
- (22) off-screen and not on-screen in the YUV format. Is
- (23) that correct?
- (24) MR. JACOBS: Objection.
- (25) Q (By Ms. Kordziel): With respect to

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- (1) the Alpine?
- (2) MR. JACOBS: You got Alpine spanning both
- (3) 30 and 40 products, so it's going to be a hopeless
- (4) record at this stage.
- (5) Q (By Ms. Kordziel): With respect to
- (6) the 5440.
- (7) A Okay. Of the Alpine - yes. You mean for the
- (8) 5440, the YUV was in an off-screen area of the frame
- (9) buffer memory.
- (10) Q Let's go back to Laguna and finish going over
- (11) this review. After the 5464, then there was the
- (12) 5465. Is that correct?
- (13) A Yes, that's correct.
- (14) Q Did the 5465 also have this tagged memory?
- (15) A No. It dropped that because the 9-bit RDRAMs
- (16) were not continuing to be produced or popular or
- (17) anything.
- (18) Q So instead of tag memory, how is the data
- (19) distinguished?
- (20) MR. JACOBS: Objection, vague and
- (21) ambiguous.
- (22) THE WITNESS: For the 65?
- (23) Q (By Ms. Kordziel): The 64, 65, yes.
- (24) A Even for the 64, the tagging was just another
- (25) feature, another way of trying to deal with the

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- (1) video in there. So the 65 had to be able to do the
- (2) video in an overlay manner, which the 64 and 62 could
- (3) not do.
- (4) It was necessary to add to it the video
- (5) features that came from the 5440 starting point. I
- (6) mean it came out of the 5480's design at that time
- (7) since that was the most current part. So it had the
- (8) back end video added to it in a manner very similar
- (9) to those video - video feature of the 5440 - I mean
- (10) 54 and 46 and 80.
- (11) Q So with the 5465, the data was read out of the
- (12) memory based on a starting address and an end point
- (13) like the Alpine family of the 5440?
- (14) MR. JACOBS: Objection, vague and
- (15) ambiguous.
- (16) THE WITNESS: Well -
- (17) Q (By Ms. Kordziel): To distinguish
- (18) between the video and graphics, since there's no
- (19) longer the 9-bit RAM bus.
- (20) A Those are really pretty different things,
- (21) because the ninth bit was only a small enhancement
- (22) over still just having everything in one single
- (23) format in the display memory and all processed at the
- (24) front end.
- (25) Q Oh, so - I'm sorry, go on.

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- (1) A So the ninth bit was not a very critical
- (2) feature, never even got used much. It was a - it
- (3) would be more just confusing - confusion in that
- (4) because it was a minor feature. It was very limited
- (5) in its functionality. Did not get really any use or
- (6) demonstration really.
- (7) Q You mentioned just a minute ago about a single
- (8) format. With respect to the 5462 and the 5464, was
- (9) data stored in a single format in the frame buffer?
- (10) A That was in general its requirement. That's
- (11) why the video - we called it front end. It took the
- (12) video and turned into the single format. Under very
- (13) limited conditions it used this ninth bit so at least
- (14) if the number of bytes per pixel could be set to -
- (15) under certain conditions to match or at least fit a
- (16) requirement, that ninth bit could kind of tag it and
- (17) do some limited switching of the way it treated
- (18) that - the other eight bits that came with that tag.
- (19) My answer is not precise because it's not
- (20) a product I really worked on.
- (21) Q Right, I understand.
- (22) A I only knew that it had major limitations on
- (23) what you could do with it, and it -.
- (24) Q You said from the frame buffer it went out to
- (25) the D/A converter and then out to the display. What

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- (1) was the purpose of having that tagged bit to
- (2) distinguish between video and graphics then if it was
- (3) all in the same format and going out to the display?
- (4) A I said they were exactly in the same format,
- (5) but I don't recall the specific area that was used
- (6) since it wasn't my product line, didn't even get used
- (7) very much in practice anywhere in the product.
- (8) Q So the 5465, that's when we get back to the
- (9) concept of having the shared memory then with storing
- (10) video and graphics in the native formats. Is that
- (11) correct?
- (12) A And again that's why "shared memory" is a very
- (13) imprecise term, even in those - before YUV data went
- (14) into some area of the memory, but then a processor
- (15) had to read it out of that area of memory, write it
- (16) into the display area of that same memory, and then
- (17) it went out through one single pipeline to the
- (18) display.
- (19) The back end video reads one area of the
- (20) memory for video at the same time that the graphics
- (21) area can read a different area of the memory for the
- (22) basic graphics display, and then those are combined
- (23) at the D/A from two separate pipelines, both being
- (24) run together.
- (25) Q I think I'm a little confused now. I thought

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- (1) with the 5462 and 64 there wasn't any back end, it
- (2) was all front end.
- (3) A Correct. The front end reads data someplace,
- (4) converts it from the YUV to the native display
- (5) format, and writes it directly into the display
- (6) portion of the memory.
- (7) Q That's all in a single format, RGB?
- (8) A The display is in a single format at one time,
- (9) at any particular time.
- (10) Q What's your definition of front end versus back
- (11) end processing?
- (12) A Front end is converting the YUV data into the
- (13) native display format and writing it back into that
- (14) same area of memory so that - and the back end is
- (15) continuing to use the video source data in its YUV
- (16) form and converting it to RGB at the very last step
- (17) before it goes to the D/A converter.
- (18) The back end also provides the zooming
- (19) function, expands the - the data to do things, and
- (20) that's much more efficient than the front end.
- (21) Q Can you go back to the front end? What does
- (22) the front end do? The converting of the YUV to -
- (23) A To RGB format.
- (24) Q So the front end converts the YUV to RGB
- (25) format, and it's stored in the frame buffer, and then

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- (1) it's read out to the display?
- (2) A Yes.
- (3) Q Okay.
- (4) A And the front end would perform the zoom
- (5) function there. The video source must be made
- (6) larger, so it has to write a lot of data back into
- (7) the display area.
- (8) Q The back end?
- (9) A The back end reads the YUV source in its same
- (10) format, does the zooming, creates more output pixels
- (11) than it got in. But that no longer consumes any more
- (12) memory band width.
- (13) Q Does the back end convert the YUV to RGB?
- (14) A Yes.
- (15) Q Going back to the 5465, what were some of the
- (16) other features of the 5465?
- (17) A Relative to what?
- (18) Q To the earlier Laguna products, the 5462 and
- (19) 64.
- (20) A Well, we could only really compare it to the
- (21) one just before, so the 65 relative to the 64, its
- (22) really significant feature was the addition of this
- (23) back end video to support overlay of the video as a
- (24) function, that the two could not produce a port
- (25) overlay.

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- (1) Q I'm sorry, the 52 and the -
- (2) A The 62 and the 64 could not support overlay of
- (3) the video surface.
- (4) Q All these numbers kind of -
- (5) A Yes, indeed.
- (6) Q - get all confused. It would be easier if
- (7) they went by the product names or something, but -
- (8) A That was its main - 65's main addition was
- (9) this video. Again it had more 3-D acceleration
- (10) function. Other things got improved.
- (11) Q What came after the 5465?
- (12) A Nothing.
- (13) Q What about the 5468? What was that? Are you
- (14) familiar with the 5468?
- (15) A No. It's not any product to my knowledge that
- (16) ever actually existed other than perhaps a number
- (17) that they - of a part that was being worked on
- (18) before they stopped new graphics development.
- (19) Q Going back, you mentioned there were three
- (20) groups, the desktop which you were a part of, this
- (21) Laguna that we kind of discussed briefly, and the
- (22) laptop. Were you familiar with the laptop products?
- (23) A People were in the same building. In general,
- (24) yes. Very unfamiliar with the numbers. That was
- (25) even more confusing in numbering systems.

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- (1) Q I see. Do you remember the product names?
- (2) A One product line was called Madderhorn, to kind
- (3) of go along with "Alpine" as a name.
- (4) Q Did the Madderhorn have a shared frame buffer
- (5) memory storing video and graphics data in the native
- (6) formats?
- (7) A Well, we're back to that same -- if we could
- (8) call it the back end video features that were like
- (9) the 5440, that incorporated such.
- (10) Q Okay. Did it incorporate all of the 5440
- (11) features but in a portable end product?
- (12) MR. JACOBS: Objection, vague and
- (13) ambiguous.
- (14) THE WITNESS: For the video overlay
- (15) functionality, it incorporated essentially the
- (16) same -- the same methods. They were different
- (17) devices, had their own idiosyncrasies, but --
- (18) Q (By Ms. Kordziel): So this was the
- (19) back end video overlay?
- (20) A Yes.
- (21) Q How is that distinguished from the video
- (22) overlay that the 5430 was capable of?
- (23) A Well, it wasn't capable of overlay.
- (24) Q So the 5430 wasn't capable of any video really?
- (25) A On its own, no. That's what I'm saying. It

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- (1) had no --
- (2) Q So would the shared memory be a part of that?
- (3) A Part of --
- (4) Q A part of the --
- (5) A -- what?
- (6) Q -- reason why the Madderhorn and the 5440 would
- (7) be capable of overlying video by itself?
- (8) A This would have to be made a reversible term,
- (9) 5440, and then other products after that that had a
- (10) back end video feature that has been called a shared
- (11) frame buffer as much after the fact as anything.
- (12) They had the overlay capability because of the method
- (13) they used to work with video and the graphics.
- (14) Q What other laptop products were there?
- (15) A I said there were a lot of things in this
- (16) family called Madderhorn, which I don't know the
- (17) names. And before that there were other chips that
- (18) had some different names and numbers and less
- (19) capabilities. But I don't recall them, the
- (20) specifics.
- (21) Q Are you familiar with the Nordic?
- (22) A That wasn't a name, but that kind of got spread
- (23) around to some products before it may have found an
- (24) actual landing place.
- (25) Q I'm sorry, what do you mean by that?

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- (1) A There was one sort of desktop product name
- (2) related to the Alpine that was also -- that had been
- (3) called Nordic, except it was one single device and
- (4) never went further. I think that might have also --
- (5) the Nordic name -- applied to some laptop products.
- (6) I guess on its own it doesn't have enough meaning.
- (7) Q What was the Nordic and the Alpine family
- (8) referring to?
- (9) A For its one single instance, there was a VRAM
- (10) based product as opposed to the DRAM. And it was
- (11) before any of the video acceleration features were
- (12) added.
- (13) Q So this was before the 5440?
- (14) A Yes.
- (15) Q What was the benefit of using DRAM instead of
- (16) VRAM?
- (17) A Cost.
- (18) Q What else?
- (19) A Cost.
- (20) Q So was there anything unique in using a VRAM --
- (21) or a DRAM instead of a VRAM?
- (22) MR. JACOBS: Objection.
- (23) THE WITNESS: For what?
- (24) MR. JACOBS: Vague and ambiguous.
- (25) THE WITNESS: The two memories are

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- (1) unique. I mean -- but --
- (2) Q (By Ms. Kordziel): Like for example
- (3) for the 5440, that uses a DRAM. Did you ever
- (4) consider using a VRAM with that product?
- (5) MR. JACOBS: Objection, lacks foundation.
- (6) THE WITNESS: That product family was a
- (7) DRAM based product family. So DRAMs were what we
- (8) used for it.
- (9) Q (By Ms. Kordziel): What happened to
- (10) the Nordic, the VRAM based product?
- (11) A Sorry, when that label got applied to
- (12) something, the desktop, it was one single device that
- (13) did not really go to production, and it probably just
- (14) is a confusion. It was like that name got used more
- (15) in some laptop products, and it probably appears
- (16) there. But I don't recall which specific products or
- (17) features in the laptop were associated with that
- (18) name.
- (19) Q What other laptop products? The Viking, are
- (20) you familiar with that?
- (21) A Again, they had a lot of names before this
- (22) Madderhorn.
- (23) Q Right.
- (24) A I don't know which names applied to which
- (25) devices.

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- (1) Q Did they have other devices that had the back
- (2) end video overlay in it?
- (3) MR. JACOBS: Objection, lacks foundation.
- (4) THE WITNESS: I can only answer that - I
- (5) mean that the Madderhorn product family were ones
- (6) that had this back end video. Whatever else there
- (7) might have been, other labels on there, I have no
- (8) idea which ones they were called.
- (9) Q (By Ms. Kordziel): I see.
- (10) A They were different.
- (11) Q Do you recall when the Madderhorn family of
- (12) products - when did they begin development on that?
- (13) A The family?
- (14) Q Was it after the 5440?
- (15) A Well, again, because that was a different
- (16) group, when they started applying that name
- (17) Madderhorn, I'm not at all certain of. I recall that
- (18) it was more towards the devices that had also a
- (19) 64-bit memory interface. So at that point - it had
- (20) the back end video. But I only can say that some
- (21) things in the laptop product family started using the
- (22) back end video approach just after the introduction
- (23) of the 5440. That was the starting point for all -
- (24) Q Was the laptop - were those laptop products
- (25) developed independently or were those features from

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- (1) the 5440 carried over into the Madderhorn family?
- (2) MR. JACOBS: Objection, vague and
- (3) ambiguous.
- (4) THE WITNESS: Can you - the back end
- (5) video features?
- (6) Q (By Ms. Kordziel): That's right.
- (7) A Well, again, there was a different design group
- (8) overall responsible for these laptop things. But all
- (9) of this specific direction towards the video overlay
- (10) all came from the same Plano and Pixel's design team.
- (11) Q Do you remember any other laptop products?
- (12) A No.
- (13) Q While you were at Cirrus, you were also
- (14) involved in various standards committees?
- (15) A Right, yes, I was a member of the VESA, many of
- (16) the different committees and subgroups.
- (17) Q Which committees were you involved in?
- (18) A All of my time? Everything at VESA, or -
- (19) okay. There was a lot of them. I had been part of
- (20) the VESA local bus committee earlier; been involved
- (21) in a number of the VESA BIOS extensions parts; and
- (22) there was the VESA monitor committee working on some
- (23) monitor interface standards for like identifying the
- (24) monitor type to the graphics card and power
- (25) management issues to the monitor. And I also

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- (1) participated in a number of VESA directions on video
- (2) connector standards, such as the VAFC and the VMC.
- (3) That sums it up.
- (4) Q When did your involvement with VESA start?
- (5) A Start?
- (6) Q Yes.
- (7) A Mostly with Acumos.
- (8) Q How many people from Cirrus were involved in
- (9) these meetings?
- (10) MR. JACOBS: Objection, vague and
- (11) ambiguous, lacks foundation.
- (12) THE WITNESS: Do you mean -
- (13) Q (By Ms. Kordziel): Were you a -
- (14) A - VESA meetings?
- (15) Q These VESA standards. Were you a particular
- (16) Cirrus designee, or did many of the engineers -
- (17) were they involved -
- (18) A Every one of these would have been different
- (19) instances, so in some areas I was the only Cirrus
- (20) representative. The local bus stuff, there were more
- (21) people involved. That affected a wider area of
- (22) products.
- (23) Q Other than the ones that you just listed, were
- (24) you involved in any other standards, standards bodies
- (25) or committees?

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- (1) A You mean other than VESA -
- (2) Q Yes.
- (3) A - or its groups?
- (4) MR. JACOBS: While at Cirrus, right?
- (5) Q (By Ms. Kordziel): While at Cirrus.
- (6) Like the PCI Multimedia Standard -
- (7) A I was trying to think - I know it's out there
- (8) and involved in it -
- (9) Q - or spec.
- (10) A - but it never really produced - well, it
- (11) produced a lot of paper, but I would have hesitated
- (12) to actually call it a spec, since it was more - it
- (13) was as much Intel promoting their own view of things
- (14) as it was a spec. But I did - was involved in that.
- (15) So I was involved in something called the
- (16) VIP, and it was yet another version of a video input
- (17) port that eventually got incorporated back into some
- (18) VESA materials, but for awhile it was a separate
- (19) ad hoc group of industry players.
- (20) Q That was something backed by Cirrus, the VIP?
- (21) A Cirrus participated early along with - I guess
- (22) it was Thompson, I guess - what's the other
- (23) product? Thompson -
- (24) Q SGS?
- (25) A SGS, yeah. But even that one and the VIP, I

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- (1) recall somebody from ATI participating, usually
- (2) remotely by phone.
- (3) Q What usually happened at these meetings?
- (4) MR. JACOBS: Objection, vague as to
- (5) "meetings."
- (6) Q (By Ms. Kordziel): The VESA
- (7) meetings. Did people give presentations?
- (8) A Well, they were just meetings talking about
- (9) trying to form standards, so people tried to offer
- (10) their approaches to the particular standard and
- (11) presented relevant material.
- (12) Q Did you ever make any presentations?
- (13) A How do you mean?
- (14) Q Did you ever make any presentations in front of
- (15) the -- during the VESA meetings or these other -- VIP
- (16) or --
- (17) A In a general sense, yes, I did contribute to
- (18) some of these standards so I wrote some documents.
- (19) They were less in the way of presentations as -- once
- (20) we actually worked on the standards, defining
- (21) concepts of it.
- (22) Q What documents did you prepare?
- (23) A The only things I truly recall were just trying
- (24) to specify some different video formats that would be
- (25) used in supporting some of these standards. I sort

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- (1) of recall that, going somewhere with this
- (2) multimedia -- PCI Multimedia Committee, that also
- (3) came from the -- the same definitions I was using for
- (4) the VESA, VMC part.
- (5) Q When you left Cirrus, what happened to your
- (6) documents?
- (7) MR. JACOBS: Objection, lacks
- (8) foundation, calls for speculation.
- (9) Q (By Ms. Kordziel): Did you leave
- (10) your documents with --
- (11) A All I can say is everything I had ever -- if I
- (12) had kept it, it stayed in the file, in filing
- (13) cabinets or wherever else it was. I no longer --
- (14) Q You don't have any documents with you now that
- (15) were back at Cirrus, that you'd used back at Cirrus?
- (16) A Any documents that I ever used before?
- (17) Q Well, you left all your documents at Cirrus?
- (18) Did you take any when you left?
- (19) A No, not really.
- (20) MS. KORDZIEL: Counsel, have you produced
- (21) all of David Keene's documents?
- (22) MR. JACOBS: I'm sorry, I don't
- (23) understand the question.
- (24) MS. KORDZIEL: Have you produced his
- (25) documents? Was somebody able to locate Dave Keene's

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- (1) documents back at Cirrus?
- (2) MR. JACOBS: That's two different
- (3) questions.
- (4) MS. KORDZIEL: Was somebody able to
- (5) locate those documents?
- (6) MR. JACOBS: I don't know whether all the
- (7) documents that he left behind were stored for the
- (8) two-and-a-half years or so, three years, since then.
- (9) I know that all the documents people were aware of
- (10) were produced. In other words, the search protocol
- (11) would have included David Keene's documents.
- (12) Q (By Ms. Kordziel): Did you have any
- (13) engineering notebooks?
- (14) A No, I was not one who kept those kinds of
- (15) things. All I could say about my documents were
- (16) anything that was not a copy of something I produced,
- (17) it then left my possession, and I can't account for
- (18) it in any way.
- (19) All of my own documents were confined to
- (20) one single large file cabinet that I left behind when
- (21) I left Cirrus, and as long as that stayed together,
- (22) everything that I had kept was all in one place, easy
- (23) to look at.
- (24) MS. KORDZIEL: Counsel, can you just
- (25) check to make sure that -- to the extent you're able

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- (1) to locate that file cabinet, that we've received all
- (2) those documents?
- (3) Q (By Ms. Kordziel): Okay. So going
- (4) back, you had mentioned that you had prepared a
- (5) document on video formats for presentation. Was
- (6) there any other presentations that you had prepared
- (7) that you can remember?
- (8) A That's a good -- that I can remember a
- (9) presentation, not really specifically. I
- (10) participated in all these things, but --
- (11) Q Generally do you -- during the meetings do you
- (12) also receive documents that other people prepare?
- (13) A Of course, we had to -- anybody that presented
- (14) something left documentation.
- (15) Q Were these meetings conducted by phone or did
- (16) you meet somewhere in person?
- (17) A VESA meetings now?
- (18) Q Yes.
- (19) A They were almost entirely everybody in the same
- (20) room in person, sometimes some people calling in on
- (21) the phone and just appearing only as a voice.
- (22) Q After you attended the VESA meetings or the
- (23) other standards committee meetings, did you prepare a
- (24) report for the people back at Cirrus? What did you
- (25) do after each meeting?

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- (1) A Some meetings -- it varied from meeting to
- (2) meeting. In general I was not a person who prepared
- (3) lots of documentation of reports. I gave lots of
- (4) information back verbally to people, just
- (5) discussions, and incorporated that in work that I
- (6) did. So I was not someone who generally produced
- (7) large amounts of written material.
- (8) Q What did you do with the information that you
- (9) obtained from VESA? Did you pass it -- you were
- (10) saying that you passed it on to other people. Was
- (11) that information used in the development of the
- (12) products?
- (13) A Well, since VESA was in the nature of trying to
- (14) establish some standards for the video computer
- (15) industry, then whatever was coming in the direction
- (16) of a standard would be brought back to Cirrus so that
- (17) we would -- could be in compliance with a standard.
- (18) As these were under development, we would be looking
- (19) at the development of the standard before it was
- (20) finalized, but to be sure that what we were working
- (21) on would potentially be in conformance with what we
- (22) would make as a guess as to where that standard would
- (23) finally end up.
- (24) Q So from those meetings you would try to guess
- (25) where the standard was going; is that correct?

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- (1) A That would be correct, right, we had to make
- (2) some guesses ahead of time.
- (3) Q Then you would try and implement that in
- (4) features in your products?
- (5) A Yes.
- (6) MR. JACOBS: When you have a good -- you
- (7) can go on as long as you want for a few more minutes,
- (8) but when it's a good moment, it's almost --
- (9) MS. KORDZIEL: Why don't we break now and
- (10) get some lunch. We'll go off the record.
- (11) (The luncheon recess was taken.)
- (12) AFTERNOON SESSION 1:00 P.M.
- (13) Q (By Ms. Kordziel): Let's go back on
- (14) the record.
- (15) Good afternoon. I thought we'd go
- (16) through now the development of the specific
- (17) products. We sort of went through an overview of all
- (18) the products, and I thought we'd start with the
- (19) Alpine.
- (20) MS. KORDZIEL: I'd like to have this
- (21) marked as Exhibit 3.
- (22) (Marked for identification: Respondent's
- (23) Exhibit Number 3.)
- (24) Q (By Ms. Kordziel): Can you identify
- (25) this document that we've marked as Exhibit 3?

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- (1) A Probably.
- (2) Q You can take a minute to look at it. Just let
- (3) me know when you're finished.
- (4) A This was before they had a number. It's been a
- (5) long time since I've seen this one, because this was
- (6) just internal marketing discussion things.
- (7) I think it was mostly for the 34. Gets
- (8) me in all these future directions. Yeah. The first
- (9) pages might be the -- the future if it were the 5434.
- (10) Q Have you seen this document before?
- (11) A Yes. It would have happened long ago.
- (12) Q Do you know who produced this document?
- (13) A As I said, I think the -- the first two pages
- (14) look like something -- looks like what I did. I
- (15) produced it myself.
- (16) Q You said this was a marketing document?
- (17) A For the purposes of -- of trying to do the
- (18) product development. It was an internal document, so
- (19) if marketing meant we showed other people in the
- (20) market, it wasn't that. We were trying to make our
- (21) marketing decisions internally, discussing kind of
- (22) the directions --
- (23) Q So this kind of document wouldn't be given out
- (24) to customers?
- (25) A No, no. This was very early and preliminary.

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- (1) Q If you could turn to the page bearing Bates
- (2) number 950. What did the Alpine AV refer to?
- (3) A I think that was the speculation on sort of
- (4) the direction that was the 5446, but also the 40 at
- (5) the same time, because we were trying to decide where
- (6) some features would end up.
- (7) Q So this is a high level --
- (8) A Yeah, after this, both of these are product
- (9) names that were just for the purpose of discussion
- (10) and never really specifically became a product after
- (11) that. These were just direction concepts.
- (12) Q I see. Under the first bullet point under
- (13) "Alpine AV," what did you mean by, "Eliminates extra
- (14) frame-buffer for digital video input"?
- (15) A At that time it would have been basically
- (16) the -- the video port was there to -- to take -- or
- (17) the idea of the port to take it from some external
- (18) video digitizer chip and put it in the same frame
- (19) buffer.
- (20) Q What was the WavePort?
- (21) A Where does it say WavePort?
- (22) Q The next page, I'm sorry, 951 at the very top.
- (23) It's a bad copy, but --
- (24) A I only see a blur of the letter E and the word
- (25) "port" following it, but I suppose that could have

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- (1) said "WavePort." You seem to be missing the rest of
- (2) the header information above that.
- (3) Q Do you know what the WavePort was?
- (4) A Yes, I invented it. In fact there's even a
- (5) patent out there from Cirrus with my name as the
- (6) inventor on it, at least part of this. So it never
- (7) actually got turned into practice. Same as I know
- (8) this was AV - later on became the 5446 with those
- (9) concepts, WavePort was a serial interface for some
- (10) Crystal audio codecs with the intention to also store
- (11) audio data as part of the same frame buffer memory.
- (12) So it was an input port for audio data, and "wave"
- (13) referring to audio waves.
- (14) Q Was Crystal part of Cirrus?
- (15) MR. JACOBS: At this time?
- (16) THE WITNESS: Yes.
- (17) Q (By Ms. Kordziel): At this time?
- (18) A Yes.
- (19) Q Going down to the bottom of the page, the
- (20) "Alpine AV ViewPort Features." That first sentence,
- (21) "Provides a method of adding digital video to the
- (22) Graphics subsystem without the cost of an extra frame
- (23) buffer," you're just referring to the video - having
- (24) a video port; is that correct?
- (25) A Yeah. Just what it says, direct input of data

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- (1) to display memory - there was yet another name for
- (2) it, AV port or video input port.
- (3) Q Further down it says, "Direct Input from Video
- (4) Codecs, Video processors (Pixel 2070) or Data
- (5) Compressors." Was this used, or - was this
- (6) developed to be used with the Pixel 2070?
- (7) MR. JACOBS: Objection, vague and
- (8) ambiguous, mischaracterizes the prior testimony.
- (9) Q (By Ms. Kordziel): I guess - what
- (10) was your understanding of that sentence?
- (11) A These were some of the examples of possible
- (12) sources of video or data to go into this port, 2070
- (13) being merely one of a number of video encoder
- (14) digitizer chips.
- (15) Q The video data that was inputted, did it go to
- (16) a shared frame buffer?
- (17) MR. JACOBS: Objection, vague and
- (18) ambiguous, lacks foundation, calls for speculation.
- (19) THE WITNESS: Well, as a video port, the
- (20) same, to directly put a video data to display memory,
- (21) then it went to the same display memory, frame
- (22) buffer.
- (23) Q (By Ms. Kordziel): At that point had
- (24) you considered having a multi-format frame buffer?
- (25) MR. JACOBS: Objection, calls for

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- (1) speculation. Do you mean he himself?
- (2) MS. KORDZIEL: I think he said that he
- (3) was - he produced this document. So when he wrote
- (4) this -
- (5) THE WITNESS: Well, let's - I don't
- (6) know.
- (7) Q (By Ms. Kordziel): Excuse me?
- (8) A Sorry. Say that question again?
- (9) Q When you had direct input of video data to
- (10) display memory, at that time had you considered a
- (11) multi-format frame buffer?
- (12) A This was to input video data in its own format
- (13) under the same memory, so the memory had more than
- (14) one format in it. At this point it wasn't getting
- (15) specific about how, once we got that, it became the
- (16) display format.
- (17) Q What is the difference?
- (18) A You can input video data and still store it in
- (19) some area of the frame buffer memory, in its original
- (20) native format. At some point in time it must be
- (21) converted to RGB analog data for the monitor.
- (22) Q Right.
- (23) A But how that happens is a separate issue from
- (24) just at least having it stored there initially.
- (25) Q So the back end video processing at this point

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- (1) hadn't been considered?
- (2) MR. JACOBS: Objection, calls for
- (3) speculation.
- (4) THE WITNESS: To actually say the back
- (5) end video, I would need to see the other - the date
- (6) of the other documents where the 5440 was at this
- (7) time, because it was - 5440 was part of the Alpine
- (8) family and relevant. So at the time the 5440 was
- (9) getting back in video, that was considered for all
- (10) other products.
- (11) Q (By Ms. Kordziel): I see. Was the
- (12) Alpine AV a precursor to the Alpine CDX?
- (13) A No. More like at the same time or - or after
- (14) it. The "CDX" term often was used in reference to
- (15) the 5440.
- (16) MS. KORDZIEL: Let's have this marked
- (17) Exhibit 4.
- (18) (Marked for identification: Respondent's
- (19) Exhibit Number 4.)
- (20) Q (By Ms. Kordziel): Can you identify
- (21) this document?
- (22) A Yes, I can. This would have come up when
- (23) engineers at Ptxel were trying to develop the
- (24) software architecture for making use of the next
- (25) video product or video compatible products in the

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- (1) graphics area.
- (2) Q Have you seen this document before?
- (3) A Yes, I recall it, at the same time.
- (4) Q If you turn to Bates number 1007, and you look
- (5) under the section 1.1 dot 4, "Description of Shared
- (6) Frame Buffer Scenario," what is your understanding of
- (7) the first sentence?
- (8) A Where it says, "For the shared frame buffer
- (9) scenario, the video frame buffer and the graphics
- (10) frame buffer are the same?"
- (11) Q Yes.
- (12) A Meaning they're the same physical block of
- (13) memory.
- (14) Q Is this referring to different formats or the
- (15) same format?
- (16) MR. JACOBS: Objection, calls for
- (17) speculation, lacks foundation.
- (18) THE WITNESS: In this instance, it's
- (19) referring to just the terms of the -- of the buffer
- (20) for these two video types without regard to their
- (21) format. And I would add that because everything that
- (22) had been done previously, a video buffer and a
- (23) graphics buffer were physically separate devices and
- (24) memory systems, such as the 2070/80 product, which
- (25) had a frame buffer and its own memory as a video

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- (1) buffer, and a graphics controller it worked with,
- (2) which had its own memory as a graphics frame buffer.
- (3) MS. KORDZIEL: Let's have this marked as
- (4) Exhibit 5.
- (5) (Marked for identification: Respondent's
- (6) Exhibit Number 5.)
- (7) Q (By Ms. Kordziel): Can you identify
- (8) this document?
- (9) A Yes. Has my name on it.
- (10) Q What was "the current VESA mem-attach work"?
- (11) A That later on got the designation VMC. That
- (12) was the work for the VESA media connector.
- (13) Q And the VESA media connector had a shared frame
- (14) buffer; is that correct?
- (15) A The VESA media connector was a specification
- (16) for the interface between some other video stream
- (17) source device and a graphics card, so it could input
- (18) this video data. The spec on that did not make any
- (19) mention or even inferences as to what happened to the
- (20) video data once it went across this connector. It
- (21) was to go into some memory.
- (22) Q Then why does it say, "VESA, mem-attach"? What
- (23) does that refer to?
- (24) A The VESA committees for that time had both the
- (25) feature connector extension and a video input port

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- (1) definition. The feature connector approach had video
- (2) that never went into any memory, was not stored in
- (3) any part of the memory associated with the graphics
- (4) device. And the VMC, video data input, was meant to
- (5) be stored directly into some piece of memory, and
- (6) that became the video buffer.
- (7) Q And that memory, did it also store graphics
- (8) data?
- (9) A The other things that that memory did were not
- (10) part of the VESA standard, discussed or implied.
- (11) Q So is it your recollection that the VESA media
- (12) channel did not disclose a shared frame buffer, or
- (13) during your discussions regarding the VESA media
- (14) channel?
- (15) A Right. The VESA media channel did not talk
- (16) about sharing a frame buffer or even -- yes.
- (17) Q Under "Capture (video input port)," point
- (18) three, "The VESA 'MediaBus' should be supported."
- (19) What did you mean by that sentence?
- (20) A Well, again, the VESA MediaBus was the media
- (21) mem-attach approach which was done with the VESA
- (22) media connector.
- (23) Q So the Alpine AV was designed to support the
- (24) VESA MediaBus?
- (25) A No, it was not.

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- (1) Q But I thought you mentioned that the VESA
- (2) MediaBus should be supported.
- (3) A That's what this says. At this time, this was
- (4) a recommendation. If this VESA MediaBus went further
- (5) we should try to support it. And the result was this
- (6) particular spec did not go far enough to receive
- (7) industry acceptance, so we subsequently never
- (8) supported it.
- (9) Q Under "Video-For-Windows acceleration," it
- (10) states under number one, "This is the most important
- (11) feature we are considering and is needed in time for
- (12) a fall Comdex demo."
- (13) Was there a Comdex demo showing the
- (14) Video-For-Windows acceleration?
- (15) MR. JACOBS: Objection, vague as to time.
- (16) THE WITNESS: I'm waiting for a
- (17) clarification, because there were always Comdex
- (18) demos, so -- do you mean --
- (19) Q (By Ms. Kordziel): Well, the
- (20) document's dated in April '93. I guess in the fall
- (21) of '93, was there a Comdex demo with this
- (22) Video-For-Windows acceleration?
- (23) A I can't actually say, not having produced the
- (24) demos that went to Comdex on that one, so I don't
- (25) know either way what was shown.

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- (1) Q So you don't know whether or not that fall
- (2) there was a Comdex --
- (3) A That fall there was certainly a Comdex, because
- (4) there is every fall.
- (5) Q But the Alpine AV --
- (6) A And Cirrus demonstrated things that they had.
- (7) What they showed at that particular one, I have no
- (8) recollection at all, and did not produce.
- (9) MS. KORDZIEL: Let me have marked Exhibit
- (10) 6 the "VESA Advanced Video Interface Committee, VAVI
- (11) Standard Proposals Backgrounder."
- (12) (Marked for identification: Respondent's
- (13) Exhibit Number 6.)
- (14) Q (By Ms. Kordziel): Can you identify
- (15) this document?
- (16) A Not right off, no.
- (17) Q Would this be one of the documents that you
- (18) would receive from attending your VESA committee
- (19) meetings?
- (20) MR. JACOBS: Objection, calls for
- (21) speculation, lacks foundation.
- (22) THE WITNESS: I attended committee
- (23) meetings that did talk about this VAVI standard, so
- (24) these documents similar to this were there.
- (25) Q (By Ms. Kordziel): Can you turn to

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- (1) Bates number 17559?
- (2) A Okay. Okay. I'm trying to look at the rest of
- (3) it to recall --
- (4) Q That's fine.
- (5) A -- what this is.
- (6) MR. JACOBS: Take your time, please.
- (7) THE WITNESS: And so the more I look at
- (8) it, the more it becomes familiar.
- (9) Q (By Ms. Kordziel): Well, let me know
- (10) when you're ready.
- (11) A VAVI was -- was a more generic name for a
- (12) couple of things they were looking at as connector
- (13) interface standards, which then became this VAFC and
- (14) this VAMC. So this was trying to at least talk about
- (15) them as possibilities together.
- (16) Q At the very top it says, "Figure 4 shows a
- (17) typical configuration of the proposed VESA Media
- (18) Channel," and in the configuration do you see the
- (19) box, "Shared Graphics/Video Memory"?
- (20) A Yes.
- (21) Q You testified just a few minutes ago that there
- (22) was no discussion of a shared graphics and video
- (23) memory with respect to the VESA Media Channel. Does
- (24) this refresh your memory?
- (25) A I said previously that the VESA Media Channel

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- (1) specification itself did not say how the memory was
- (2) specifically stored, but -- some possible application
- (3) discussion, but the connector spec itself did not
- (4) call out a shared memory as such.
- (5) Q But during the VESA Media Channel meetings
- (6) there was discussion regarding a shared graphics
- (7) video memory?
- (8) A Well, as I've said several times today, this
- (9) shared memory is -- because there was one single
- (10) memory doing some type of -- showing more than one
- (11) data, even for Windows acceleration, always been
- (12) shared. So that's not been a very precise term, and
- (13) it cannot on its own have any precise meaning.
- (14) Q Under the first full paragraph, it says that,
- (15) "The VM-Channel allows video data to be directly fed
- (16) into the conventional graphics frame buffer."
- (17) A Yes.
- (18) Q And then at the very end it says, "This method
- (19) of attachment of video devices obviates the need for
- (20) frame buffers in those devices."
- (21) Going back to --
- (22) MR. JACOBS: Wait. Do you want him to
- (23) comment on that?
- (24) THE WITNESS: Well, that one --
- (25) Q (By Ms. Kordziel): Yes?

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- (1) A In what devices? Even this is not a
- (2) well-constructed sentence, but --
- (3) Q Well, this memory attached, that's discussed in
- (4) Exhibit 6. Is that the VESA mem-attach that you
- (5) refer to in Exhibit 5?
- (6) A Say it again?
- (7) Q In Exhibit 6 regarding the discussion of the
- (8) VESA Media Channel, it discusses a shared graphics
- (9) and video memory. Is that -- in Exhibit 5, is that
- (10) the current VESA mem-attach that you were referring
- (11) to there?
- (12) A The VESA mem-attach refers to what was also
- (13) called VESA Media Channel.
- (14) Q That's right. And this is --
- (15) A This was the connector spec for getting video
- (16) data and putting it into the memory, would have been
- (17) controlled by the graphics card receiver.
- (18) Q And this shared graphics/video memory, was that
- (19) ever -- was this ever considered with respect to the
- (20) Alpine AV?
- (21) A Well, it's still the -- "shared graphics/video
- (22) memory" is not precise enough, just as much as the --
- (23) as an example, the first Laguna device, the 5462,
- (24) which did not have the back end video, but it did
- (25) have a video input port, and it also was constructed

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- (1) to nominally work even with the VESA Media Channel.
- (2) So it could take video data from this input port and
- (3) put it into the RAM bus memory that it had with this
- (4) device.
- (5) But then to display that on the screen,
- (6) it had to do front end processing, and it could not
- (7) support overlay and do other things. So two
- (8) different data types were in the memory, but how it
- (9) was handled after that were two completely different
- (10) ways.
- (11) Q So the difference between this shared
- (12) graphics/video memory and the Alpine CDX product was
- (13) how it was handled after -- through the video back
- (14) end processing?
- (15) MR. JACOBS: Objection, calls for
- (16) speculation.
- (17) THE WITNESS: Could you --
- (18) Q (By Ms. Kordziel): I just wanted to
- (19) understand --
- (20) A Okay. Which are we comparing it to? Wait a
- (21) minute.
- (22) Q I guess we're comparing this with the AV.
- (23) MR. JACOBS: "This" is the drawing on
- (24) Figure 4, the example?
- (25) MS. KORDZIEL: That's right.

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- (1) MR. JACOBS: Comparing that with the
- (2) implementation of the AV or --
- (3) THE WITNESS: Again, Figure 4 is only
- (4) illustrating that in some completely unknown,
- (5) undisclosed way, that some piece of memory that's
- (6) connected to a graphics controller receives some
- (7) video data. How that's done, finally put to the
- (8) computer display in conjunction with graphics data,
- (9) is not mentioned.
- (10) The Alpine back end video was one method
- (11) of doing this. The Laguna in its initial form having
- (12) some front end processing is a different way.
- (13) Q (By Ms. Kordziel): So the difference
- (14) between the VESA Media Channel and the Alpine or the
- (15) Laguna product is how the data from the memory was
- (16) handled? Is that what you said?
- (17) A No, that's not what I said. What I'm saying is
- (18) that you can't really say the difference. The VESA
- (19) Media Channel was specifically a connector interface,
- (20) the definition I described, the format of the data
- (21) and the signals that would go across that connector,
- (22) without regard then to exactly how that -- once that
- (23) data went across that connector, how it got displayed
- (24) or other things. It only was there so that it could
- (25) go into a memory storage. And then that same memory

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- (1) storage, a frame buffer for the video did not have to
- (2) be in an external device.
- (3) But it didn't go into the -- all the rest
- (4) of the display aspects of it or the specifics of
- (5) implementation. It was a connector transport
- (6) standard. The AV was a method of display of a
- (7) product for that.
- (8) Q How is that shared graphics/video memory and
- (9) the VESA Media Channel different from the shared
- (10) graphics/video memory that's present in the Alpine
- (11) CDX product?
- (12) MR. JACOBS: Could I have the question
- (13) back again, please?
- (14) (The record was read by the reporter.)
- (15) THE WITNESS: It's different in that
- (16) shared memory in the VESA Media Channel is just a
- (17) label and a concept. It's not part of the -- the
- (18) spec. I mean it doesn't -- it talks about just
- (19) getting the data into a place. So they're different
- (20) because they're not talking about the same things.
- (21) Q (By Ms. Kordziel): I don't think
- (22) you've answered the specific question. How is this
- (23) shared graphics/video memory different from the
- (24) shared graphics memory -- shared graphics and video
- (25) memory in the Alpine product?

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- (1) MR. JACOBS: Objection, asked and
- (2) answered.
- (3) THE WITNESS: I'm saying they're
- (4) different because they're not -- this -- in this
- (5) instance, VESA Media Channel, saying shared graphics
- (6) and video memory is nothing more than saying the
- (7) video data goes into the block of memory and there's
- (8) graphics data in there and it stops at that point.
- (9) So it has no specificity as to how then they get
- (10) altered, manipulated for display on the screen.
- (11) The Alpine AV or the 5440 had a specific
- (12) implementation for displaying graphics and video that
- (13) came in that same -- same memory. Its method was
- (14) this back end video pipelines.
- (15) Q (By Ms. Kordziel): But that's the
- (16) processing. I'm just referring to the actual memory,
- (17) the frame buffer. How is this frame buffer different
- (18) from the frame buffer in Alpine CDX?
- (19) A And I'm saying the processing of what you do
- (20) with the data after it's in there is -- is the only
- (21) place there can be a difference, and this doesn't
- (22) discuss how you get to display it, only talks about
- (23) just getting data into some memory.
- (24) So they're different because they're
- (25) covering different portions of an overall feature

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- (1) or -- or solution, which is just having video come
- (2) from someplace, graphics from someplace, and the
- (3) computer user sees it on a screen. They don't know
- (4) how it got there.
- (5) Q But in the design of it, how is this frame
- (6) buffer design different from the frame buffer?
- (7) Disregard the processing that occurs after the data
- (8) is taken from the frame buffer, but how is this
- (9) shared graphics and video memory different from the
- (10) shared graphics and video memory of the Alpine
- (11) product?
- (12) MR. JACOBS: Objection, asked and
- (13) answered.
- (14) THE WITNESS: All I can say is I can't
- (15) possibly answer that, because this has no aspect of
- (16) it to look at and say what it is in order to contrast
- (17) it with something that is a specific implementation
- (18) in a device. This is merely a square on a piece of
- (19) paper with some words in it. It doesn't say anything
- (20) else about what it is except "memory."
- (21) Q (By Ms. Kordziel): Well, except that
- (22) it's shared graphics and video.
- (23) MR. JACOBS: Same objection.
- (24) THE WITNESS: Right, without any further
- (25) definition anywhere in this as to what that means.

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- (1) I've said, since this is a rather broadly used term,
- (2) just that it's shared only inasmuch as graphics data
- (3) got to this memory, video data got to this memory.
- (4) That's as far as it goes for anything that you can
- (5) say what it means.
- (6) Q (By Ms. Kordziel): I still --
- (7) don't think you've answered the question on how is it
- (8) different from the Alpine frame buffer.
- (9) MR. JACOBS: Asked and answered.
- (10) THE WITNESS: I really have. I'm not
- (11) trying to --
- (12) MR. JACOBS: I believe the answer is --
- (13) THE WITNESS: -- to debate. I'm saying
- (14) there really is no answer, because to be different
- (15) this has to say that it is something specific. So
- (16) the Alpine has a specific way of using the shared
- (17) data that's in a memory, and this just talks about
- (18) getting it there.
- (19) Q (By Ms. Kordziel): Okay. Well --
- (20) A Without --
- (21) Q I guess my problem with that was the "using."
- (22) I considered to be the processing later, not just the
- (23) frame buffer.
- (24) A Well, yes, the processing later is the key
- (25) part. And this isn't involving that. So then --

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- (1) could you ask the question any differently then?
- (2) Q I guess disregarding the back end processing
- (3) that occurs, how is this frame buffer that is shared
- (4) graphics and video any different from the Alpine CDX
- (5) frame buffer?
- (6) MR. JACOBS: Asked and answered.
- (7) Q (By Ms. Kordziel): What about the
- (8) processing makes it different?
- (9) A Which processing?
- (10) Q You were saying that you couldn't answer it
- (11) because of the processing.
- (12) A Because this doesn't say what the processing
- (13) is. So how can it be different from something that
- (14) has no definition?
- (15) Q Well, the definition of this would be that it's
- (16) sharing the same space, graphics and video data.
- (17) A If the PCI bus writes data into the frame
- (18) buffer for the graphics card and puts it in an off
- (19) stream location, that same memory is also sharing
- (20) different things. But that doesn't say anything
- (21) about how it gets to the screen, too.
- (22) For the purposes of this VESA Media
- (23) Channel, this was as much a promotional idea to show
- (24) that some piece of memory shared the data that came
- (25) from different places so that only one device had all

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- (1) of the memory requirements for input storage. But it
- (2) didn't go any further than that. So for inputting
- (3) data from a video port into the memory with a device,
- (4) they were similar. But only inasmuch as just getting
- (5) video data in and adding it into the memory.
- (6) Q Well -- were you going to say anything?
- (7) A No.
- (8) Q But doesn't the memory here from the PC go into
- (9) the graphics controller, and from there it's going to
- (10) the shared graphics/video memory, and then it's going
- (11) back to the graphics controller, and then into the
- (12) RAM DAC?
- (13) A Well, you might note that in Figure 5b, there
- (14) is an arrow there showing video source and curving
- (15) around through the graphics controller and into this
- (16) little gray rectangle that's in this block called
- (17) "Shared Graphics/Video Memory."
- (18) Also note there is no arrow coming out of
- (19) that little gray block and going around --
- (20) Q I'm sorry, what block?
- (21) A The little gray block within the larger white
- (22) blocks that says, "Shared Graphics/Video Memory," the
- (23) small gray block which has received this arrow from
- (24) the video source therefore must be containing the
- (25) video data has no arrows coming out of it even

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- (1) showing that it ever does escape from this block and
- (2) go to the display. This is only about input.
- (3) Q But there's another arrow from the shared
- (4) graphics/video memory that goes back to the graphics
- (5) controller. Well, if you look at Bates number 17559,
- (6) it says that, "As shown in Figure 5(a), the
- (7) VM-Channel is based on a single frame buffer
- (8) architecture."
- (9) A Yes?
- (10) Q So it does have a shared graphics and video
- (11) memory?
- (12) A Which?
- (13) Q The VMC -
- (14) A The VESA -
- (15) Q The VESA Media Channel. Yes or no?
- (16) MR. JACOBS: Asked and answered.
- (17) THE WITNESS: I'll just say again - I
- (18) mean the same memory in this would be able to receive
- (19) video data and graphics. After that the term "shared
- (20) graphics and video memory" can start to mean
- (21) different things in different instances. So
- (22) answering yes, that it's a shared graphics and video
- (23) memory, without taking any other context, could seem
- (24) to be saying it's something different after that.
- (25) This could only be interpreted in an

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- (1) extremely narrow way of just merely saying that same
- (2) piece of memory receives two different kinds of data,
- (3) and in that specific case, then they both share
- (4) that. But that's as far as it can go.
- (5) Q Well, let's go on. Who is Brian Bounds?
- (6) A He's one of the lead engineers that worked on
- (7) the Pixel devices, worked on the 5440.
- (8) Q Did he also work on the 5430?
- (9) A No.
- (10) Q Was he based in Plano or -
- (11) A Yes, Plano.
- (12) Q Do you know whether or not he's still with
- (13) Cirrus?
- (14) A He's not.
- (15) Q Do you know where he is now?
- (16) A Probably still in Texas somewhere, but -.
- (17) MS. KORDZIEL: I'd like to have this
- (18) marked Exhibit Number 7.
- (19) (Marked for identification: Respondent's
- (20) Exhibit Number 7.)
- (21) Q (By Ms. Kordziel): Can you identify
- (22) this document that we've marked as Exhibit 7?
- (23) A Uh-huh, yes.
- (24) Q What was the purpose of this document?
- (25) A It will take me a minute.

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- (1) Q That's fine, just let me know.
- (2) A Robert Nally was Pixel's architect for some
- (3) feature, so he's produced some documents where we
- (4) were talking about various ways to achieve product
- (5) feature goals, and so many things were offered as
- (6) possibilities.
- (7) Okay. You still have a question?
- (8) MS. KORDZIEL: Was there a question?
- (9) (The record was read by the reporter as
- (10) follows: "What was the purpose of this
- (11) document?")
- (12) THE WITNESS: Saying in general just
- (13) looking at possible features and ways to get to
- (14) them. Mostly this is talking about VAFC, is what it
- (15) keeps mentioning. So that was a video overlay,
- (16) meaning some enhancements, but with all of the video
- (17) storage still being someplace outside, kind of the -
- (18) the locked, genlocked type of overlay approach.
- (19) Q (By Ms. Kordziel): And what was the
- (20) Alpine vfw?
- (21) A It meant Video-For-Windows in an engineer kind
- (22) of way.
- (23) Q How is it different from the Alpine AV?
- (24) A Just another label we did around the same
- (25) time. Neither of them had enough meaning on their

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- (1) own, just all these temporary labels.
- (2) Q On the first page it says, "Maintain 64 bit
- (3) ALPINE Family compatible (CL543x)." This is
- (4) referring to the features of the 5430 product?
- (5) A 64-bit was meaning like the 34 type of
- (6) functionality.
- (7) Q Is there a graphics pipeline in this picture?
- (8) A The picture on page one?
- (9) Q Yes.
- (10) A Doesn't appear to be. But that's not -.
- (11) Q The playback pipeline with the Y zoomer and the
- (12) PackJR, would that be a front end video processing?
- (13) MR. JACOBS: Objection, calls for
- (14) speculation, lacks foundation.
- (15) THE WITNESS: If you really wanted a
- (16) real answer, I'd have to look at this for several
- (17) minutes, and using that time, try to get back to the
- (18) concepts. We had so many speculative concepts going
- (19) around at the same time.
- (20) Q (By Ms. Kordziel): Why don't you
- (21) take a couple of minutes?
- (22) Would you say the Y zoomer - would that
- (23) be the front end video processing?
- (24) A In this particular proposal, this would be a
- (25) front end. Even goes so far as to call it that.

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- (1) Q Is it front end because it's processed before
- (2) being put in the frame buffer?
- (3) A Yes.
- (4) Q And then back end would be processing from data
- (5) retrieved from the frame buffer?
- (6) A Right. Which also is mentioned in here. This
- (7) particular thing never got put into any actual
- (8) products.
- (9) Q Well, Mr. Nally testified at his deposition
- (10) that this was the invention of his patent.
- (11) A What?
- (12) MR. JACOBS: Do you have that transcript?
- (13) MS. KORDZIEL: I don't have his
- (14) transcript yet.
- (15) THE WITNESS: Of what patent?
- (16) MS. KORDZIEL: Of the '525 Patent.
- (17) MR. JACOBS: I think in the absence of
- (18) the deposition transcript that you want to show the
- (19) witness, this question is improper.
- (20) THE WITNESS: If the '525 -- is this the
- (21) one patent about the Cirrus, about the video? That's
- (22) the number on it?
- (23) MR. JACOBS: '525 is the patent at issue
- (24) in this lawsuit.
- (25) THE WITNESS: Okay. But --

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- (1) Q (By Ms. Kordziel): '5440 is an
- (2) embodiment of the '525 Patent.
- (3) A Then I can't understand what you're saying,
- (4) what he might have meant, because this thing --
- (5) specifically about something -- this PackJR isn't
- (6) something I recognize, being put into a part, front
- (7) end.
- (8) Q Turn to the next page. Under number one,
- (9) "Playback" --
- (10) A Uh-huh.
- (11) Q It says, "The data is stored in the frame
- (12) buffer in PackJR format. The data will be stored in
- (13) 'on screen' memory."
- (14) What data does this sentence refer to?
- (15) MR. JACOBS: Objection, calls for
- (16) speculation, lacks foundation.
- (17) THE WITNESS: Well --
- (18) Q (By Ms. Kordziel): Would that be the
- (19) video data?
- (20) A It would have been this PackJR data in this
- (21) form, but this isn't what we really did. This is
- (22) talking about yet another way that video could be
- (23) incorporated into things, but --
- (24) Q Well, let's just focus on this document. Would
- (25) the data be video data?

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- (1) MR. JACOBS: Objection, calls for
- (2) speculation, lacks foundation.
- (3) THE WITNESS: Which --
- (4) Q (By Ms. Kordziel): Under the first
- (5) sentence, "The data is stored in the frame buffer in
- (6) PackJR format."
- (7) A The only data that could ever be in Pack -- in
- (8) this Pack format was video data. But --
- (9) Q What was your understanding when it said, "The
- (10) data will be stored in 'on screen' memory"?
- (11) A This is something different than what -- what
- (12) we did, or that patent. On-screen -- this is --
- (13) Q Video data was not stored in on-screen memory?
- (14) MR. JACOBS: What are you asking him
- (15) about now?
- (16) Q (By Ms. Kordziel): I was asking him
- (17) what was his understanding of the second sentence,
- (18) "The data will be stored in 'on screen' memory." Was
- (19) that video data would be stored in on-screen memory?
- (20) MR. JACOBS: As a recipient of this memo
- (21) back in '93, you're asking him what his understanding
- (22) was?
- (23) Q (By Ms. Kordziel): Yes.
- (24) A For this particular way of showing video, this
- (25) is saying this one here would be a way of putting it

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- (1) into the -- into the on-screen memory in some form.
- (2) We did -- you have that in different
- (3) aspects in different chips, but -- so this is yet
- (4) another way of showing video, but -- okay. Did I
- (5) answer that or not?
- (6) MR. JACOBS: I think you did.
- (7) THE WITNESS: I think --
- (8) Q (By Ms. Kordziel): Why would you
- (9) store data, video data, in nonscreen memory?
- (10) MR. JACOBS: Objection, calls for
- (11) speculation, lacks foundation, ambiguous.
- (12) THE WITNESS: I would say -- I don't
- (13) know. I mean --
- (14) Q (By Ms. Kordziel): There's no
- (15) advantage of storing video data on on-screen memory?
- (16) MR. JACOBS: Objection, ambiguous, calls
- (17) for speculation.
- (18) THE WITNESS: Depends on what the problem
- (19) is to have an advantage. The more ways you have of
- (20) doing things, the more flexibility you have. You
- (21) have different limitations. So --
- (22) Q (By Ms. Kordziel): Do you recall
- (23) whether any of the Alpine products stored video data
- (24) in nonscreen memory?
- (25) A Well, as I said before, we had different ways

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- (1) of doing it with extreme limitations of the formats,
- (2) the video. So it wasn't very flexible. But - just
- (3) kind of putting them together.
- (4) MR. JACOBS: He testified before that
- (5) video could be an RGB format, in some context -
- (6) MS. KORDZIEL: Please let the witness
- (7) testify.
- (8) Q (By Ms. Kordziel): Did any of the
- (9) Alpine products store video data in YUV format on the
- (10) on-screen memory?
- (11) I'm sorry, you have to answer yes or no,
- (12) because the court reporter won't be able to -
- (13) A I haven't answered yet.
- (14) Q Okay.
- (15) A I was just trying to ponder that. And I don't
- (16) recall any of them actually doing that. We talked
- (17) about things.
- (18) Q Under B, "PackJR," it again says that,
- (19) "playback data will be stored in the frame buffer in
- (20) a Packed or encoded YUV 4:1:1 format." Then it goes
- (21) on to say that, "The data will actually be placed in
- (22) 'on screen' memory in the frame buffer."
- (23) But your recollection is that the Alpine
- (24) products didn't store video data in the YUV format in
- (25) the on-screen memory?

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- (1) A Correct. When we used it, it wasn't like this.
- (2) Q What was Robert Nally's contribution to the
- (3) '525 Patent? Earlier we had talked about how you had
- (4) thought of ideas with respect to the Alpine AV. What
- (5) were his particular ideas?
- (6) MR. JACOBS: Objection, vague and
- (7) ambiguous, calls for speculation, lacks foundation.
- (8) THE WITNESS: And in addition, I wasn't
- (9) there at the time. He and John Schafer and others
- (10) were responsible for making the implementation of
- (11) video features for this 5440. How he shared the
- (12) ideas on that, worked on it, is not something I was
- (13) present to witness.
- (14) Q (By Ms. Kordziel): You didn't have
- (15) any input on those ideas?
- (16) MR. JACOBS: Objection, vague and
- (17) ambiguous.
- (18) THE WITNESS: To the two of them? I did
- (19) not talk about it with them, all three of us
- (20) together.
- (21) MS. KORDZIEL: Let's mark this Exhibit
- (22) 8.
- (23) (Marked for identification: Respondent's
- (24) Exhibit Number 8.)
- (25) THE WITNESS: I'm starting to remember

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- (1) this now, because we didn't really do this exactly.
- (2) MR. JACOBS: Referring to 7?
- (3) THE WITNESS: Right.
- (4) Q (By Ms. Kordziel): You're referring
- (5) to Exhibit 7?
- (6) A These were some other possibilities that Robert
- (7) Nally was talking about that in the end we didn't
- (8) really implement like this.
- (9) Q I see. What didn't you implement, going
- (10) back -
- (11) A Doing this Y zoomer thing. We did deal with
- (12) PackJR and tried to reformat that slightly on the
- (13) input through a range of memory addresses on the
- (14) card, but we didn't do any other processing to it,
- (15) and we didn't actually use it in the final device,
- (16) trying to put it to an on-screen area and do that.
- (17) Q In the 5440 was there a video port?
- (18) A Yeah.
- (19) Q Was it VAFC - VAFC compliant?
- (20) A It had a VAFC compliant connector. That wasn't
- (21) really a video port.
- (22) MR. JACOBS: Can we take a break?
- (23) MS. KORDZIEL: That's fine. Why don't we
- (24) take a short break and go off the record.
- (25) (A recess was taken.)

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- (1) Q (By Ms. Kordziel): Let's go back on
- (2) the record.
- (3) Let's go to Exhibit 8. Oh, before we go
- (4) to Exhibit 8, were there any other features that are
- (5) found in Exhibit 7 that was never made into a Cirrus
- (6) product?
- (7) MR. JACOBS: Take your time to answer
- (8) that.
- (9) THE WITNESS: Boy, let's see. I can't
- (10) really - this was one of the early proposals and
- (11) speculations on ways to address video in the next
- (12) products before we finally chose a method. So this
- (13) has similarities and differences.
- (14) Q (By Ms. Kordziel): When did you
- (15) finally choose a method?
- (16) MR. JACOBS: Objection, calls for
- (17) speculation, lacks foundation.
- (18) THE WITNESS: Do you mean choose the
- (19) method that became the implementation of the 5440?
- (20) Q (By Ms. Kordziel): That's right.
- (21) A When it became the last choice, that was made
- (22) in Plano. I don't know the time exactly. I wasn't
- (23) participating.
- (24) Q Let's turn to Exhibit 8 then.
- (25) A Sure.

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- (1) Q Can you identify this document?
- (2) A Only in general, that I recall also at this
- (3) time trying to get the software specifications for,
- (4) in general, this DCI concept, just part of supporting
- (5) Video-For-Windows under Microsoft Windows software.
- (6) Q Have you seen this document before?
- (7) A I really can't say for certain.
- (8) Q Are you familiar with the Microsoft DCI
- (9) specification?
- (10) A In very general terms, yeah.
- (11) Q In the middle of the page where it starts with,
- (12) "Unlike the GDI," what is your understanding of that
- (13) bullet point?
- (14) A Which "Unlike the GDI"?
- (15) Q Bullet point number three.
- (16) A Where it says, "Unlike the GDI, the DCI
- (17) interface allows multiple colorspace?"
- (18) Q Right.
- (19) A The GDI was the core part of Microsoft
- (20) Windows, just the graphics device interface. That
- (21) was just a specification for the -- the normal
- (22) visible Windows work space, so it only had one single
- (23) color space at a time, which was the -- then what
- (24) they called the native format. For adding on video
- (25) playback, the software specifications on there then

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- (1) had other formats around for the video. So that's
- (2) really all it did involve. It had other color spaces
- (3) to find at the same time as the primary display
- (4) screen.
- (5) Q So other color spaces would be YUV color
- (6) spaces?
- (7) A That would have been one possible one.
- (8) Q And then it goes on to say, "Therefore, if the
- (9) display hardware is capable of converting YUV data to
- (10) RGB, the DCI interface allows the DCI client to write
- (11) YUV data into the frame buffer, allowing the hardware
- (12) to convert it."
- (13) What's your understanding of that
- (14) sentence?
- (15) A This was -- being as they were a software
- (16) company, they didn't really think too much about how
- (17) the hardware did certain things. But they needed
- (18) these data types to go through the applications, in
- (19) this case to the graphics driver software.
- (20) So they had at least defined there could
- (21) be other data types that were on there, and this DCI
- (22) extension allowed multiple video formats to be
- (23) treated at the application level at the same time.
- (24) And then that data could be written anywhere that was
- (25) memory.

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- (1) For Microsoft's purpose, the location of
- (2) that wasn't specific or important. It was just a
- (3) memory transfer. This says, "but will allow" -- if
- (4) the hardware and the graphics then could accept YUV
- (5) data, then that could be a possible destination for
- (6) this data type.
- (7) Q So the DCI interface allows a multi-format
- (8) frame buffer?
- (9) A Well, it doesn't prevent it. It doesn't
- (10) really ask for it either.
- (11) Q Would this suggest it?
- (12) A Well, since this particular sentence says, "If
- (13) the hardware is capable of converting YUV data to
- (14) RGB, the DCI interface allows the client to write it
- (15) into the frame buffer, allowing the hardware to
- (16) convert it." That's merely saying that somehow --
- (17) acknowledging that somehow that YUV data must be
- (18) converted to RGB data. It could be done right during
- (19) the transfer, before the actual data finally gets
- (20) into the frame buffer, or anywhere else after that.
- (21) Q But the sentence before says, "the DCI
- (22) interface allows multiple colorspace -- not just RGB
- (23) data." We had discussed how that meant -- could also
- (24) refer to YUV data.
- (25) A Right. But I also said that -- just as data

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- (1) types only. It meant that a graphics Windows driver
- (2) that was there could be told here's data in this
- (3) color type, here's the regular screen data in the
- (4) color type that has been common to GDI. Now if it's
- (5) a DCI color type, can you deal with it and accept it.
- (6) Before Microsoft Windows, there was no
- (7) way to even have a definition at the application
- (8) level of more than one color space at a time. So
- (9) this just provided the information to the graphics
- (10) card, if it could use it, it could at least know what
- (11) color space it had.
- (12) Q But here, after the DCI interface -- I guess
- (13) we're now able to write YUV data into the frame
- (14) buffer?
- (15) A Well, we're able to write -- from this DCI
- (16) point of view, we're able to write data to the
- (17) graphics interface at the software level. And
- (18) hardware could have converted it in other places.
- (19) But that wasn't part of DCI. Again it didn't really
- (20) consider the hardware implications of color spaces.
- (21) Q But doesn't it say here that, "the display
- (22) hardware is capable of converting YUV data to RGB, it
- (23) allows the DCI client to write YUV data into the
- (24) frame buffer?"
- (25) A Yes. Okay. It says that. But -- what

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- (1) exactly is your question?
- (2) Q Wouldn't that allow YUV data to be written into
- (3) a frame buffer that also has RGB data?
- (4) A Okay. The DCI spec itself allowed the graphics
- (5) driver support to be able to say here is an address
- (6) for this software to write data to. It was
- (7) allowable. That address could have been part of the
- (8) graphics frame buffer or not. And so the application
- (9) could write its data out to a specific address range.
- (10) At that point then the hardware that got
- (11) it could have been converting it to RGB at any point
- (12) after that, and it didn't matter. So it could have
- (13) gone into the front end before it actually ever got
- (14) into the frame buffer. It could have already been
- (15) turned into RGB data. Only at the interface between
- (16) the application and the driver was it still in YUV
- (17) form.
- (18) Q Well then, based on that, why would you have
- (19) multiple color spaces? It seems here it says to
- (20) write the YUV data into the frame buffer. The
- (21) conversion is afterwards.
- (22) A Say that again. What? DCI looked like it
- (23) offered the possibility of doing new things that
- (24) weren't -- weren't part of it. It addressed things
- (25) in a software manner that needed to -- needed

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- (1) solutions. But it didn't tell how to do the
- (2) solutions.
- (3) So there were opportunities to try to now
- (4) solve problems for video display in different ways,
- (5) since the applications could now have new information
- (6) to send over to the graphics drivers.
- (7) Q That new information would be YUV data?
- (8) A Well, the information being the type of data it
- (9) was going to send in a standard way. Previously to
- (10) Microsoft Windows, all the data was of much fewer
- (11) data type, so there was no way applications in a
- (12) standard form could tell the graphics driver, here is
- (13) a different kind of data. It could do it only in
- (14) proprietary ways that were outside of the Windows
- (15) spec.
- (16) Q Going to the next page, 795, at the very top,
- (17) what's your understanding of that first sentence?
- (18) A The concept of a surface?
- (19) Q Which means the buffer will hold graphics video
- (20) data? What does that mean to you?
- (21) A Again from the point of view of the DCI
- (22) interface being really a software specification, they
- (23) talked about anything of memory that would receive
- (24) the -- the data to be a surface, because they viewed
- (25) things as like your screen being just a

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- (1) two-dimensional area of storage that held the data.
- (2) So they just called all things surfaces. It would
- (3) usually be some type of memory. It could have been a
- (4) system memory or graphics memory or anything.
- (5) Q So a surface would be, for example, a frame
- (6) buffer that contained graphics data and video data?
- (7) A That would be one possibility. Surface was
- (8) just about the storage. They were everywhere on a
- (9) system.
- (10) Q It says here that the primary surface is
- (11) another name for the visible portion of the frame
- (12) buffer. What is your understanding of that sentence?
- (13) A For DCI they started to put the label of a
- (14) primary display surface on the actual -- as it said,
- (15) visible screening area. It was part of the
- (16) graphics. Before, that was the only destination for
- (17) graphics function calls. So it didn't really have
- (18) any other -- there was only one surface being talked
- (19) about before.
- (20) Q Would that be the on-screen?
- (21) A The primary surface is typically the display
- (22) on-screen --
- (23) Q On-screen area?
- (24) A -- on-screen area.
- (25) Q Going down to off-screen surface, "The

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- (1) offscreen surface is any buffer that is not in the
- (2) visible frame buffer." What is your understanding of
- (3) that sentence?
- (4) A Well, for this surface, would have been some
- (5) block of memory that's someplace that's not the
- (6) screen buffer. It could be another part of the
- (7) graphics card, it could be system memory, it could
- (8) even be to a different system, if you could transfer
- (9) the data there.
- (10) Q In that same paragraph it refers to Nordic.
- (11) Do you know what product that's referring to, the
- (12) desktop product or the portable product?
- (13) A Seeing this refreshed my memory on that, that
- (14) the Nordic was the laptop product, and that was the
- (15) only place Nordic got applied. I forgot the -- the
- (16) one sort of a nominal DRAM part of the desktop was
- (17) called Northstar. So that had confused them
- (18) temporarily. So Nordic was the pre-Madderhorn name
- (19) for some of the laptop graphics accelerators.
- (20) Q Nordic was the precursor --
- (21) A To MadderHorns.
- (22) Q -- to Madderhorn. The Nordic -- did the Nordic
- (23) have on-screen/off-screen surfaces?
- (24) MR. JACOBS: Objection, lacks
- (25) foundation.

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- (1) Q (By Ms. Kordziel): In its frame
- (2) buffer?
- (3) MR. JACOBS: Calls for speculation.
- (4) THE WITNESS: The Nordic - the Nordic at
- (5) least at the time of the Alpine, there was at some
- (6) point a Nordic chip that had about - ended up with
- (7) the same features as the 5440, came just a little bit
- (8) later, and -
- (9) Q (By Ms. Kordziel): So Nordic was
- (10) after the 5440, or was it -
- (11) A Very very slightly after, since some of its
- (12) video features were still coming from the same people
- (13) in Plano, Texas, that were doing the 40.
- (14) Q Since you mentioned that the Nordic had
- (15) features from the 5440, did the Nordic have a
- (16) multi-format frame buffer?
- (17) A How do we -
- (18) Q A frame buffer that can store video data and
- (19) graphics data in its native formats.
- (20) A Yes.
- (21) Q And the Nordic also had the back end
- (22) processing, video processing that was present in the
- (23) 5440?
- (24) A One of the Nordics. Again, that name got
- (25) applied to sort of a family of products, so just like

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- (1) there were Alpine labeled chips that didn't have the
- (2) video there, I think there was a Nordic that didn't
- (3) have the back end video.
- (4) Q But one of the Nordics was comparable to the
- (5) 5440?
- (6) A Somewhere there was the same feature level.
- (7) MS. KORDZIEL: Let's mark this
- (8) Exhibit 9.
- (9) (Marked for identification: Respondent's
- (10) Exhibit Number 9.)
- (11) Q (By Ms. Kordziel): Can you identify
- (12) this document?
- (13) A Maybe. Some of these seem to be duplicate
- (14) pages.
- (15) Q These are consecutive Bates numbers. I don't
- (16) know why that was duplicated.
- (17) A Some of these seem to be exactly the same.
- (18) There's a lot of numbers here that aren't actually
- (19) new pages.
- (20) Q Unfortunately that's how it was produced, so
- (21) that's what we have.
- (22) A It has some familiarity, but I may or may not
- (23) have actually seen this particular set of
- (24) presentations.
- (25) Q Would these be marketing presentations?

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- (1) A Well, being how it's labeled confidential, it's
- (2) probably how they did it maybe to show the - at
- (3) least a select potential customer doing the NDA's.
- (4) Q So it would be under an NDA presentation, but
- (5) they were trying to sell these products to the
- (6) customers?
- (7) MR. JACOBS: Objection, calls for
- (8) speculation, lacks foundation, ambiguous.
- (9) THE WITNESS: Around this time they were
- (10) selling, but - future plans, product directions.
- (11) Q (By Ms. Kordziel): Going to Bates
- (12) number 3271, it's entitled, "Video Playback
- (13) Acceleration."
- (14) A Okay.
- (15) Q Would that be the Alpine CDX?
- (16) MR. JACOBS: Objection, lacks
- (17) foundation.
- (18) THE WITNESS: At this particular time
- (19) when this was done, I don't know what it was about,
- (20) what it was viewed to be. I mean it was before it
- (21) had enough names to it, I think.
- (22) Q (By Ms. Kordziel): So you can't
- (23) remember what this, I guess, functional diagram would
- (24) be referring to?
- (25) A Referring to much less specific, just product

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- (1) directions.
- (2) Q Do you recall any other marketing discussions
- (3) with customers during this time frame of October '93
- (4) or at the end of '93?
- (5) MR. JACOBS: Objection, vague and
- (6) ambiguous.
- (7) THE WITNESS: No. Not anything specific.
- (8) Q (By Ms. Kordziel): Did you ever
- (9) attend any of these discussions with customers?
- (10) A Which discussions?
- (11) Q Regarding the Alpine products.
- (12) A Well, which Alpines? All of them?
- (13) Q All of them. How about the 5440?
- (14) A For its development, its features that were
- (15) unique to it relative to the 30 were, especially in
- (16) the early times, being done more at Pixel, and not so
- (17) much here locally. So there was a lot of
- (18) presentations that got done by the Pixel people.
- (19) They also had marketing people. So that was often
- (20) done, and I wasn't participating at all.
- (21) MS. KORDZIEL: Let's mark this Exhibit
- (22) 10.
- (23) (Marked for identification: Respondent's
- (24) Exhibit Number 10.)
- (25) Q (By Ms. Kordziel): Can you identify

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- (1) this document?
- (2) A Not specifically. It was put together more at
- (3) the Pixel location. Especially at that time, they
- (4) tended to use their Pixel Semiconductor name a lot
- (5) more prominently than being Cirrus Logic. So this
- (6) incorporates slide things that were generated
- (7) originally in Fremont, that product family, to their
- (8) own presentation.
- (9) The first few are all just general
- (10) nonvideo accelerator Alpine family chips that
- (11) somebody was writing the spec for.
- (12) Q Would this be the type of presentation that was
- (13) shown to customers?
- (14) MR. JACOBS: Objection, lacks foundation,
- (15) calls for speculation.
- (16) THE WITNESS: Hmmm. Could you try that
- (17) again? Could you try that question again? Would
- (18) this itself have been shown to a customer?
- (19) Q (By Ms. Kordziel): Was this
- (20) presentation, was it a type that was shown to
- (21) customers?
- (22) MR. JACOBS: Lacks foundation, calls for
- (23) speculation.
- (24) THE WITNESS: I'd say in general at
- (25) Cirrus, any time we put -- had something that looked

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- (1) like it was from power point slides and we put the
- (2) word "Confidential" there, it likely was shown to a
- (3) very select group of customers as specific
- (4) preliminary -- under NDA-disclosed material, but not
- (5) in general to customers, just to specific --
- (6) Q (By Ms. Kordziel): Customers under
- (7) NDA's. Do you recall this ever being shown to a
- (8) customer?
- (9) A I can't recall, no, either way, no. I don't
- (10) know.
- (11) Q Now the Alpine AVA, was that the same as the
- (12) Alpine CDX?
- (13) A It might have been in some people's mind.
- (14) Cirrus had -- at that point had a lot of different
- (15) labels for similar things, and not always a lot of
- (16) really correct communication among all the marketing
- (17) people that were presenting different possibilities.
- (18) Q Who would have been involved in marketing at
- (19) this time period, December of 1993?
- (20) MR. JACOBS: Marketing of what?
- (21) Q (By Ms. Kordziel): Marketing of
- (22) these -- for example showing this presentation to
- (23) others. Marketing the Alpine products.
- (24) A A whole mess of people in different places in
- (25) different parts of products. There were -- I mean

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- (1) sales people. The more direct marketing people,
- (2) there was a Gerald Wineinger at Pixel who -- at least
- (3) there were fewer individuals at Pixel, so he was
- (4) usually the marketing person that might have made
- (5) presentations from their point of view.
- (6) Q Do you know, is he still at Cirrus?
- (7) A He's been gone from Cirrus longer than either
- (8) Schafer or Nally. He went somewhere else like a year
- (9) or so before they left.
- (10) Q If you turn to page 17743 --
- (11) A Uh-huh.
- (12) Q -- what does it mean by "Full Motion Video,"
- (13) the second bulletin says, "Single Full Motion Video
- (14) Window"?
- (15) MR. JACOBS: Objection, calls for
- (16) speculation, lacks foundation.
- (17) THE WITNESS: Okay. Where are you asking
- (18) again?
- (19) Q (By Ms. Kordziel): What was your
- (20) understanding of single full motion video window?
- (21) A These being just presentations of sort of -- of
- (22) features we were going to try to offer support for,
- (23) this was -- especially in terms of Pixel's frame of
- (24) reference, with video-conferencing on your mind, it
- (25) just only meant having real-time video being

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- (1) displayed in a window view on the screen. We were
- (2) going to support it.
- (3) Q Did the 5440 have real-time video?
- (4) MR. JACOBS: Objection, vague and
- (5) ambiguous.
- (6) THE WITNESS: It could display video on
- (7) real time as it came in from some source, so, yeah.
- (8) Q (By Ms. Kordziel): Real-time is like
- (9) NTSE format, video from a TV? That's what I mean by
- (10) real-time video, not versus playback video.
- (11) MR. JACOBS: Vague and ambiguous.
- (12) THE WITNESS: Which is not what full
- (13) motion necessarily means. Motion video is just a
- (14) continuous stream of changing video data.
- (15) Q (By Ms. Kordziel): But with respect
- (16) to the 5440, as it was implemented, could that
- (17) receive real-time video?
- (18) A Through the video port in that way? Yeah,
- (19) digitized YUV data.
- (20) Q What was your understanding of the multi-format
- (21) frame buffer, in the middle of the page?
- (22) MR. JACOBS: Lacks foundation, calls for
- (23) speculation.
- (24) THE WITNESS: I would have to speculate
- (25) on what the -- the context of all the rest of this,

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- (1) where it came from. As I said, there are a lot of
- (2) ways to have a frame buffer have more than one
- (3) format, get it there, so we talked about this as a
- (4) general concept all over the place. Different
- (5) products had different ways of dealing with it
- (6) afterwards. As I said, like the Laguna and the 5440
- (7) had very different ways of dealing with at least a
- (8) frame buffer that did contain data in multiple
- (9) formats.
- (10) Q (By Ms. Kordziel): The Laguna was in
- (11) a single format?
- (12) A No. The first Laguna -
- (13) Q The first - the first two, 62 and 64. Is that
- (14) correct?
- (15) A - still accepted multiple formats of data to
- (16) go into their memory. But how they allowed it to be
- (17) displayed compared to the 5440 were very different.
- (18) Q How was it different?
- (19) A 54 - the 62 and 4 took the data through the
- (20) area and processed it in the front end and then put
- (21) it into the display area of the memory, and the 5440
- (22) left the other formatted data still in the off-screen
- (23) area at one instance and read it at the same time as
- (24) it read their graphics data from the display area,
- (25) and performed the operations at the back end.

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- (1) Q Did the Laguna family - did any product in
- (2) the Laguna family store video data in its YUV format
- (3) in the on-screen areas of the frame buffer?
- (4) A Not to my recollection.
- (5) MS. KORDZIEL: Let's mark this as
- (6) Exhibit 11.
- (7) (Marked for identification: Respondent's
- (8) Exhibit Number 11.)
- (9) Q (By Ms. Kordziel): Can you identify
- (10) this document?
- (11) A In general, yes.
- (12) Q Have you ever seen this document before?
- (13) A I believe - well, I can't recall this specific
- (14) document. I just recognize the new appearance of
- (15) this Alpine CDX flying CD graphic.
- (16) Q It's almost exactly - it's very similar to
- (17) Exhibit 10 that we were looking at. Would this be a
- (18) document that would be a presentation that would be
- (19) shown to customers?
- (20) A If it's like the other one, similar, it seems
- (21) to be lacking any date on it to identify it.
- (22) Q Do you ever recall this being shown to
- (23) customers?
- (24) A I do not.
- (25) MS. KORDZIEL: Let's mark this

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- (1) Exhibit 12.
- (2) (Marked for identification: Respondent's
- (3) Exhibit Number 12.)
- (4) Q (By Ms. Kordziel): Can you identify
- (5) this document?
- (6) A No.
- (7) Q Did you ever hear of a "Super Video Card"
- (8) proposal from IBM?
- (9) A Super video?
- (10) Q The next page. That was the name they referred
- (11) to it, as "Super Video Card."
- (12) A There it says super - no, this is IBM Japan,
- (13) the Japan office. No, I recognize all the names but
- (14) these are both the - the laptop group and people
- (15) from - some names from Pixel and some names from
- (16) those who were specifically at the Japan Cirrus
- (17) office. I don't really know what it's about.
- (18) Q So you've never heard about this IBM proposal?
- (19) A No, no, I don't remember this.
- (20) MS. KORDZIEL: Let's mark this
- (21) Exhibit 13.
- (22) (Marked for identification: Respondent's
- (23) Exhibit Number 13.)
- (24) Q (By Ms. Kordziel): Can you identify
- (25) this document?

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- (1) A Only inasmuch as I recognize now that Nordic
- (2) was the laptop product group name for the graphics
- (3) chip, but I had no participation in any of their
- (4) presentations.
- (5) Q Would this be presented to customers?
- (6) MR. JACOBS: Objection, lacks foundation,
- (7) calls for speculation.
- (8) THE WITNESS: I don't know who put this
- (9) together or whether it was for internal or external,
- (10) I have no way of knowing what this was used for.
- (11) Q (By Ms. Kordziel): If you turn to
- (12) page 17834 -
- (13) A Uh-huh.
- (14) Q There on the second frame it says, "IBM
- (15) Internal Use Only." Do you see that on the bottom?
- (16) A Oh, this kind of thing that looked like it must
- (17) have been stamped there in red or something?
- (18) Q Yes. Do you know why that would have been -
- (19) A No.
- (20) Q - put there?
- (21) A I haven't a clue.
- (22) Q Could this be perhaps something given to IBM?
- (23) A Again, I have no idea what this was for.
- (24) Q If you look on page 17830, it has a video
- (25) playback window. There's also a video overlay port.

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- (1) You had mentioned earlier that Nordic also was
- (2) comparable to the 5440. Is that correct?
- (3) A At some point in the Nordic product family,
- (4) incorporated into the back end video that was
- (5) basically the same as the 5440. But other things
- (6) that were called Nordic also got promoted as video,
- (7) but they weren't the same.
- (8) Q From looking at this presentation, can you tell
- (9) whether or not it had the back end video processing?
- (10) MR. JACOBS: Vague and ambiguous.
- (11) What's the "it"?
- (12) MS. KORDZIEL: The Nordic product.
- (13) MR. JACOBS: He's just testified it's a
- (14) line of products.
- (15) MS. KORDZIEL: That's identified here.
- (16) MR. JACOBS: That's what I want to get on
- (17) the record. What is this?
- (18) THE WITNESS: Okay. Here on 17830 -
- (19) Q (By Ms. Kordziel): Yes?
- (20) A - when they say Nordic MVA, then it was at
- (21) least a slightly more specific designation of one of
- (22) the Nordics, the motion video accelerator.
- (23) Q I'm sorry, where are you? On page 17 -
- (24) A 17830, "Video Playback Window," second - the
- (25) Nordic MVA was the device that was - I believe was

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- (1) the one incorporating the same video features as the
- (2) 5440.
- (3) Q You weren't present at this presentation?
- (4) A I don't even know if it was a presentation. I
- (5) don't know what it was for.
- (6) MS. KORDZIEL: Let's have this marked
- (7) Exhibit 14.
- (8) (Marked for identification: Respondent's
- (9) Exhibit Number 14.)
- (10) Q (By Ms. Kordziel): Can you identify
- (11) this document for us?
- (12) A This looks like one of the earlier forms of
- (13) documents starting to go into features of what
- (14) eventually was the 5440 produced by John Schafer.
- (15) His initials are at the bottom here.
- (16) Q If you look under "Video Playback Features," it
- (17) states, "Optional on-screen storage of video allows
- (18) acceleration with no additional frame buffer
- (19) memory." What was your understanding of that
- (20) sentence?
- (21) A That goes back to the earlier Robert Nally
- (22) proposal of a feature that was talked about as
- (23) something but really did not get finally incorporated
- (24) in the actual production part. It was yet another
- (25) way of trying to do video.

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- (1) Q So as the actual product, video is stored only
- (2) in the off-screen memory. Is that correct then?
- (3) MR. JACOBS: Objection, asked and
- (4) answered, vague and ambiguous.
- (5) THE WITNESS: I'd say the 5440, the way
- (6) we ended up using it was to have video on an
- (7) off-screen. The substance of this kind of feature, I
- (8) don't really recall how much of that was actually
- (9) implemented but not really made use of.
- (10) Q (By Ms. Kordziel): Did it have the
- (11) capability of storing video on-screen?
- (12) MR. JACOBS: Objection, vague and
- (13) ambiguous, asked and answered.
- (14) THE WITNESS: I can't give a definitive
- (15) answer, because this was already a not really well
- (16) defined possible feature that was partly implemented
- (17) in the actual product but not really supported
- (18) actively in the software.
- (19) Q (By Ms. Kordziel): What do you mean
- (20) by partly implemented? You had said that the 5440
- (21) product did not have on-screen storage of video.
- (22) A Well, see, again, that's a - it's difficult to
- (23) give a precise answer to that, because there's so
- (24) many different flavors of video. It did make an
- (25) attempt to try to put a very limited set of what

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- (1) could be called video directly to the on-screen, so
- (2) that if there was a limited amount of total memory on
- (3) the card, then there might not be enough off-screen
- (4) storage space to put the video in an ideal form,
- (5) which is what was really desired for these products.
- (6) So there was an attempt made to address with a lot
- (7) less features still putting video into the on-screen
- (8) area with many limitations, and a far more limited
- (9) set of possible formats that could be supported,
- (10) positions.
- (11) So I'm saying it was very limited in what
- (12) it could support, and it didn't really get
- (13) implemented all of the way. We didn't really use it,
- (14) so I don't recall exactly how far that went.
- (15) Q Earlier you testified it wasn't implemented in
- (16) the 5440 and the other Alpine products.
- (17) MR. JACOBS: Objection.
- (18) Q (By Ms. Kordziel): Now I'm getting
- (19) confused by your testimony.
- (20) MR. JACOBS: Objection, vague and
- (21) ambiguous, mischaracterizes prior testimony.
- (22) THE WITNESS: It was - because what is
- (23) being implemented has - or is or is not being
- (24) implemented for that has never really been clearly
- (25) defined. The final product, the 40, not even all of

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- (1) the possible internal features became part of the
- (2) actual register spec that got produced. The 5446
- (3) itself after that definitely did not incorporate
- (4) this, but the 40 with the development in Plano had
- (5) some functions in there that - that were viewed by
- (6) people at Pixel, but didn't -
- (7) Q (By Ms. Kordziel): So the 5440 could
- (8) store video in the YUV format in the on-screen areas
- (9) of the frame buffer?
- (10) A I'm having difficulty answering that because it
- (11) was talked about as another way of using video,
- (12) but - and I don't recall it ever actually being made
- (13) use of once the part went to production as part of
- (14) our general support of it. Whether it had some
- (15) pieces still left in the hardware that just got
- (16) neglected, I really can't be certain of.
- (17) Q Because your testimony is a little different
- (18) from earlier, so I'm trying to figure out why.
- (19) A It's not really different, it's just that this
- (20) was - this was one part of it that was really just
- (21) talked about more at Pixel as an idea that - I know
- (22) that I never carried it on in the later products.
- (23) where I got more directly involved in, which was
- (24) after the 40 and the 46.
- (25) All I really recall of the discussions on

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- (1) it and - and that we had some -
- (2) Q Why do you think it was implemented in the 5440
- (3) now?
- (4) MR. JACOBS: Objection, mischaracterizes
- (5) testimony.
- (6) THE WITNESS: No, I didn't say I think it
- (7) was. I really have no recollection of it being
- (8) carried out in the 40, but I also don't really know
- (9) for a fact that there wasn't some aspect of that in
- (10) either design.
- (11) I can't answer it with absolute certainty
- (12) yes or no.
- (13) Q (By Ms. Kordziel): Okay. Because
- (14) earlier today you were very certain that the 5440 did
- (15) not have that - did not have on-screen storage of
- (16) video.
- (17) A No, I was certain that it didn't incorporate
- (18) this Y zoom part that was in that one particular -
- (19) Q But we also talked about -
- (20) A There was a piece of that, yeah.
- (21) Q - on-screen.
- (22) A And it didn't have an ordinary YUV on-screen,
- (23) something special with this Pack format in a limited
- (24) aspect. I don't really know.
- (25) Q So you don't know whether or not the 5440 could

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- (1) store video data in the YUV format in its on-screen
- (2) areas?
- (3) A I do not.
- (4) Q During the breaks did you talk with counsel at
- (5) all regarding your testimony?
- (6) A Regarding the past testimony? No, not really.
- (7) Q Today's testimony, during the breaks, you
- (8) didn't discuss on-screen areas or -
- (9) A No, we didn't talk about on-screen or
- (10) off-screen.
- (11) Q So you didn't discuss your testimony?
- (12) A What - what does that mean? We talked about
- (13) it, but I don't know what -
- (14) Q You talked - what did you talk about regarding
- (15) your testimony?
- (16) MR. JACOBS: You can discuss the topics,
- (17) the general topics we covered, without revealing the
- (18) specifics of attorney/client communication.
- (19) THE WITNESS: Well, we talked about VESA
- (20) committees in general, what they do, other
- (21) companies's reluctance to say too much about what
- (22) they do, and -
- (23) Q (By Ms. Kordziel): Generally you're
- (24) not supposed to confer with counsel during breaks.
- (25) So you didn't talk about on-screen storage at all?

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- (1) A No.
- (2) Q I'm just trying to figure out what - because
- (3) earlier today - your testimony's changed a little.
- (4) I just want to try to figure out why you had changed
- (5) that testimony.
- (6) MR. JACOBS: Mischaracterizes the
- (7) witness's testimony.
- (8) THE WITNESS: Yeah. The only area my
- (9) testimony might be absolutely clear has been on this
- (10) area of this on-screen storage of some parts of
- (11) video, which was really never part of the product's
- (12) features on there, and it was just kind of a vague
- (13) thing for Pixel.
- (14) So until I see more things that bring a
- (15) few more things back to my memory on that - but it
- (16) really wasn't a big aspect of it. So I don't
- (17) remember much about how we did it, if at all.
- (18) Q (By Ms. Kordziel): The WavePort
- (19) features, were they implemented in the 5440?
- (20) A That never actually got implemented in any
- (21) device.
- (22) Q Why weren't they implemented in the 5440?
- (23) MR. JACOBS: Calls for speculation.
- (24) THE WITNESS: Because we didn't have
- (25) enough time to add extra features to it for the

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- (1) design schedule, and it wasn't a critical feature.
- (2) Q (By Ms. Kordziel): Could it have
- (3) been because of customer visits?
- (4) MR. JACOBS: Calls for speculation.
- (5) THE WITNESS: No, it was -- the WavePort
- (6) was just an audio extra function that was a feature
- (7) dropped for lack of -- lack of time and resources.
- (8) Q (By Ms. Kordziel): So you don't
- (9) remember any discussions with customers regarding
- (10) WavePort?
- (11) A Well, WavePort was my -- sort of my invention
- (12) or whatever. So I don't think we talked about that
- (13) to really any customers, and it just got dropped out
- (14) because -- no time for it.
- (15) MS. KORDZIEL: Let's mark this
- (16) Exhibit 15.
- (17) (Marked for identification: Respondent's
- (18) Exhibit Number 15.)
- (19) Q (By Ms. Kordziel): Can you identify
- (20) this document that we've marked Exhibit 15?
- (21) A Yes.
- (22) Q It was from you to Robert Nally and John
- (23) Schafer?
- (24) A Uh-huh.
- (25) Q How did you become aware of these two -- the

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- (1) patents that you refer to in this memo?
- (2) A Specifically, I don't recall. Somehow I became
- (3) aware that one or both of these companies had been
- (4) making noises about these patents being something
- (5) they were going to try to make use of.
- (6) Q What do you mean by "make use of"?
- (7) A In claiming infringement and trying to -- to
- (8) say -- to offer some broad interpretation of their
- (9) patent in terms of other industry solutions.
- (10) Q What do you mean by, "We should be prepared for
- (11) possible action on the part of either patent holder"?
- (12) A It seemed at the time to me they might be using
- (13) their patent to talk about anybody that did sort of
- (14) the feature connector overlay thing to be a
- (15) combination, so anybody that supported even the VAFC
- (16) could become some target for action, patent
- (17) litigation. We should just be aware of this for how
- (18) we did our external overlay feature.
- (19) Q Were you aware that a possible Cirrus product
- (20) might be infringing one of these patents?
- (21) A At this time, I didn't believe that anything we
- (22) had was, but it also looked like someone might make
- (23) an attempt to overly broaden the nature of their
- (24) claims to almost include anything that ever had video
- (25) in it. I thought we should be aware of how we talked

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- (1) about our stuff.
- (2) Q After you sent this memo to Robert Nally and
- (3) John Schafer, what happened? Did you discuss these
- (4) patents?
- (5) A As I remember, this one pretty much went the
- (6) one direction, and I had it to their attention, and
- (7) that's about as far as it went.
- (8) Q Do you know whether or not they cited these
- (9) patents to the Patent Office?
- (10) MR. JACOBS: Objection, vague and
- (11) ambiguous.
- (12) THE WITNESS: In terms of --
- (13) Q (By Ms. Kordziel): The prosecution
- (14) of their '525 Patent.
- (15) A I would doubt that they would, since I didn't
- (16) even believe this had any relevance to it, or didn't
- (17) even know that they were planning a patent
- (18) application on that at the time.
- (19) All of this really was about, as I said,
- (20) the video and stuff coming from some external thing.
- (21) I thought this related more to looking at the 2070/80
- (22) plus some other graphics device, and that combination
- (23) of the product might be then a -- an attack. But I
- (24) mean -- considered in terms of this.
- (25) Q Did you often send memos like this to Robert

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- (1) Nally and John Schafer?
- (2) A No. This might have been about the only time.
- (3) It was pretty seldom if ever.
- (4) Q If you didn't think this was too relevant, why
- (5) did you point this out, these patents, to their
- (6) attention?
- (7) MR. JACOBS: Objection, vague and
- (8) ambiguous, mischaracterizes prior testimony.
- (9) THE WITNESS: Relevant -- what I said is
- (10) I thought it was relevant in there of 2070/2080
- (11) system solutions on there. So I thought they should
- (12) be aware of that for their product family.
- (13) Q (By Ms. Kordziel): I see. Really
- (14) just for the 2070/2080?
- (15) A Yes.
- (16) MS. KORDZIEL: Let's mark this
- (17) Exhibit 16.
- (18) (Marked for identification: Respondent's
- (19) Exhibit Number 16.)
- (20) Q (By Ms. Kordziel): Can you identify
- (21) Exhibit 16?
- (22) A Uh-huh, sure.
- (23) Q At the very beginning you say, "I find these
- (24) two patent applications strangely familiar." Which
- (25) two patent applications were you referring to?

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- (1) A This didn't get attached to -- specifically
- (2) which ones? I can't recall back. I don't -- hmmm.
- (3) I don't know whether -- yeah, I don't know which two,
- (4) or if they were both ones that came with the name,
- (5) Vlad Bril, who was involved in the testing of the
- (6) laptop.
- (7) MS. KORDZIEL: Let's mark this
- (8) Exhibit 17.
- (9) (Marked for identification: Respondent's
- (10) Exhibit Number 17.)
- (11) Q (By Ms. Kordziel): Does this refresh
- (12) your recollection?
- (13) A It would be at least one of those. As I
- (14) mention, that's what the same variable pixel depth
- (15) format was.
- (16) Q You mentioned Robert Nally's Alpine video
- (17) proposal. Could it be his patent application on the
- (18) '525 Patent application which is on the Alpine CDX
- (19) and other products?
- (20) A One of Robert Nally's Alpine video proposals
- (21) was just some of the product features, not any part
- (22) of any patent application. Which one of those, I
- (23) don't even know if it's anything we've ever --
- (24) anything we've seen, since there were a lot of --
- (25) MS. KORDZIEL: We'll mark this

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- (1) Exhibit 18.
- (2) THE WITNESS: -- a lot of proposals.
- (3) (Marked for identification: Respondent's
- (4) Exhibit Number 18.)
- (5) Q (By Ms. Kordziel): Could you have
- (6) been referring to Exhibit 18? This is the
- (7) patent-in-suit in this investigation.
- (8) A Yeah, no, this isn't -- no, no, this is -- no,
- (9) this isn't the one. I didn't even know about this
- (10) one. They already had some other Pixel originated
- (11) patents going on for just -- format and video came
- (12) out of the 2070/80, or something.
- (13) Q But this is the patent that covers the Alpine
- (14) family of products, the Alpine video --
- (15) MR. JACOBS: Objection, mischaracterizes
- (16) the prior testimony.
- (17) THE WITNESS: Which one?
- (18) Q (By Ms. Kordziel): The '525 Patent.
- (19) A This 18? Yes, that's correct.
- (20) Q Uh-huh.
- (21) A And that's why it wasn't the -- one of the two
- (22) patent applications I was talking about in this
- (23) memo. That's not -- this isn't the one
- (24) (indicating). There were other patent applications
- (25) that were before this that had come with Robert

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- (1) Nally's name on them. But this isn't the one.
- (2) Q Which patent application is it?
- (3) A The number or the name, I don't recall at all.
- (4) He had several. If I saw it, I might remember. But
- (5) it wasn't -- it wasn't -- it was way before this
- (6) (indicating).
- (7) Q It was also covering the Alpine family of
- (8) products?
- (9) A No, no, it had nothing to do with the Alpine
- (10) family.
- (11) Q Then why did you compare the figures in Exhibit
- (12) 17 to the Alpine video proposal?
- (13) A Well, I compared this to the Alpine video
- (14) proposal at the time.
- (15) MR. JACOBS: "This" being --
- (16) THE WITNESS: "This" being the variable
- (17) pixel depth and format patent that has the name Vlad
- (18) Bril on it, to the Alpine, not to -- I believe that
- (19) there was another patent application at the same time
- (20) that was also involving Vlad Bril that had a
- (21) different name on it. There may have been two. I
- (22) don't know -- I don't know why I said two.
- (23) Q (By Ms. Kordziel): You weren't
- (24) comparing these two patent applications --
- (25) A I was not comparing this '25 to this '64 at

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- (1) all. That's for sure.
- (2) Q Why did you send this memo to John Schafer and
- (3) Robert Nally?
- (4) A Because -- okay. Vlad Bril, the engineer that
- (5) was part of the laptop group, had been incorporating
- (6) the features that were being developed at Plano, but
- (7) sometimes he would make small modifications and
- (8) then -- and he'd put his name on things that he had
- (9) been instructed in from Robert Nally before that.
- (10) Q So you don't believe Vlad Bril is the proper
- (11) inventor of this patent?
- (12) MR. JACOBS: Objection, calls for a legal
- (13) conclusion, calls for speculation, lacks foundation.
- (14) THE WITNESS: It was more internal
- (15) politics, I thought he was leaving out the name of an
- (16) early contributor.
- (17) Q (By Ms. Kordziel): But the '664
- (18) Patent was filed before the '525 Patent. So this
- (19) would be the earlier patent, the earlier filing date.
- (20) A Yes. Doesn't mean they have any -- as I
- (21) mentioned, there were a lot of things that happened
- (22) from Pixel that were products and patents and things
- (23) that weren't just only this one.
- (24) Q So it would be that Vlad Bril was the original
- (25) inventor then if this was the earlier patent?

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- (1) MR. JACOBS: Objection, vague and
- (2) ambiguous, lacks foundation, calls for a legal
- (3) conclusion, misstates the law.
- (4) THE WITNESS: I have to go back now and
- (5) read this in order to even say whether this is even
- (6) an invention or something that has any similarity to
- (7) this other one.
- (8) Q (By Ms. Kordziel): If you want to
- (9) take a few minutes to take a look at that, that's
- (10) fine.
- (11) A Yeah.
- (12) MR. JACOBS: What's the pending question?
- (13) MS. KORDZIEL: Would you read it back?
- (14) (The record was read by the reporter as
- (15) follows: "So it would be that Vlad Bril
- (16) was the original inventor then if this
- (17) was the earlier patent?")
- (18) THE WITNESS: If that was the
- (19) question - these are two different - completely
- (20) different patents. Inventor of what?
- (21) Q (By Ms. Kordziel): Have you seen the
- (22) '864 Patent application before?
- (23) A I suppose at some point I - I must have. I
- (24) know the date, basically - but - 27 and 29.
- (25) Q If you look on column five of this patent -

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- (1) A Uh-huh. All these diagrams.
- (2) Q Lines - column five, starting at line 27, it
- (3) states that, "It is a further object of the present
- (4) invention to share a single memory device for both
- (5) video pixel data and graphics pixel data."
- (6) Do you recall reading that?
- (7) A Not really.
- (8) Q Would this memory array, 601, be a shared frame
- (9) buffer?
- (10) A 601 where?
- (11) Q On the diagrams. You need to look at Figure 7.
- (12) A There it is.
- (13) Q Figure 7, element 601, "Memory Array."
- (14) Can memory array 601 store both video
- (15) and graphics data in the native formats?
- (16) A Apparently so.
- (17) Q Excuse me?
- (18) A It would appear to be so.
- (19) Q Is there a pipeline for a processing video?
- (20) MR. JACOBS: Objection.
- (21) THE WITNESS: I don't see that as such.
- (22) How do you mean that?
- (23) Q (By Ms. Kordziel): There's a color
- (24) converter, isn't there?
- (25) A There is - there's one portion there that

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- (1) converts to color, yes. It's not a pipeline.
- (2) Q What's your definition of a pipeline?
- (3) A All the data storage like having a FIFO as part
- (4) of it dedicated and carrying it through.
- (5) Q Although 790 refers to a CRT and MVW-FIFO.
- (6) MR. JACOBS: I'm going to object to this
- (7) line of questioning. Are you asking him for his
- (8) understanding when he wrote this memo or are you
- (9) asking him to sit here today and interpret this
- (10) patent?
- (11) MS. KORDZIEL: I'm trying to figure out
- (12) his understanding, but he didn't remember the
- (13) patent. That's why we're going through the patent,
- (14) but this memo wasn't directed to the Nally Patent.
- (15) MR. JACOBS: It's 3:45. I'm wondering how
- (16) long you're going to go on this and what the
- (17) relevance of it is and why he's sitting here today
- (18) trying to study the Bindish Patent when somebody
- (19) could spend hours trying to understand what it's
- (20) directed to.
- (21) MS. KORDZIEL: From here, from his memo.
- (22) It appears that he was referring to the '864 Patent
- (23) as familiar to some Alpine video proposal. I'm
- (24) trying to find out what he meant by that statement.
- (25) MR. JACOBS: So as long as it's directed

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- (1) to that, I think it's permissible.
- (2) THE WITNESS: And as far as it was
- (3) directed towards that, it was really this - this
- (4) switching between - even as this Figure 7 is
- (5) showing, kind of switching between this YUV to RGB
- (6) converted data and this palette data at this point
- (7) being some mention of the Alpine features. Still
- (8) further back it went - it was different. But it
- (9) covered some basic part of that feature proposal at
- (10) the higher level that was - already been talked
- (11) about.
- (12) Q (By Ms. Kordziel): Do you know what
- (13) products - whether or not this patent covers any
- (14) Citrus products?
- (15) A I believe that elements of this got
- (16) incorporated in one of these Nordic devices, but
- (17) which number along with it, I can't say.
- (18) Q Why did you at the very last sentence say,
- (19) "Note the lack of Robert Nally"?
- (20) A Same as I said it looked a lot - it looked
- (21) like some of the high level features he had been
- (22) talking about in the video - in the Alpine video
- (23) proposal. But then when it went through, didn't
- (24) really say any more about where the ideas came from.
- (25) Q I assume the ideas came from the inventors that

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- (1) are named on the patent.
- (2) MR. JACOBS: What's the question?
- (3) THE WITNESS: And --
- (4) MR. JACOBS: What's the question?
- (5) MS. KORDZIEL: Why he put the statement,
- (6) "Note the lack of Robert Nally."
- (7) MR. JACOBS: Asked and answered.
- (8) THE WITNESS: As I said, I thought it
- (9) looked like proposals that Robert Nally was making
- (10) before, and that he didn't get included on this.
- (11) Q (By Ms. Kordziel): What happened
- (12) after you sent this memo to John Schafer and Robert
- (13) Nally?
- (14) A Nothing actually.
- (15) Q Did you ever talk to them about this memo?
- (16) A I asked them if they received it, they said
- (17) they saw it, and they were going to make -- didn't
- (18) want to make any case of it, weren't concerned.
- (19) Q So you can't remember what the other patent
- (20) application was?
- (21) MR. JACOBS: Asked and answered.
- (22) THE WITNESS: It says, "these two patent
- (23) applications." I have no recollection of why it said
- (24) two.
- (25) Q (By Ms. Kordziel): You don't think

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- (1) It's the patent application that became the '525
- (2) Patent?
- (3) A That is correct. I don't believe it was
- (4) that --
- (5) Q What? I'm sorry.
- (6) A There were other patents from Pixel that was --
- (7) talked about switching to video sources that were
- (8) related to their 2070/2080.
- (9) Q But that doesn't have anything to do with the
- (10) Alpine video proposal.
- (11) A That's -- I -- right. These are different, I
- (12) think. There is another patent from the same laptop
- (13) graphics that must be slightly similar but had a
- (14) different name, which I didn't remember, that I was
- (15) mentioning being -- looking a little bit like the
- (16) Alpine video feature proposal.
- (17) Lots of patent applications also came
- (18) from this laptop graphics group. Many applications.
- (19) Q So you -- let me just make sure I understand.
- (20) So you pointed out the '864 Patent to John Schafer
- (21) and Robert Nally, and they didn't do anything about
- (22) invention, or nothing ever came of this?
- (23) MR. JACOBS: Objection, lacks foundation,
- (24) calls for speculation.
- (25) THE WITNESS: Brought it to their

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- (1) attention, and they didn't feel it warranted anything
- (2) further.
- (3) MS. KORDZIEL: Let's mark this
- (4) Exhibit 19.
- (5) (Marked for identification: Respondent's
- (6) Exhibit Number 19.)
- (7) Q (By Ms. Kordziel): Can you identify
- (8) this document?
- (9) A Uh-huh, yes. I'm surprised this is one that
- (10) even happened to survive, all these hand-scribbled
- (11) notes.
- (12) Q What did you mean when you wrote, "5440
- (13) provides VAFC and shared-frame buffer windowing"?
- (14) A I mean just that.
- (15) Q What did you mean? Define -- well, we have
- (16) talked about a lot of definitions for shared frame
- (17) buffer. So what definition of shared frame buffer
- (18) were you using here?
- (19) A In the most -- in the most generic sense then.
- (20) This was in regard to -- trying to contrast their
- (21) video overlay feature connector solution to a generic
- (22) concept of shared frame buffer, more in the view of
- (23) how Intel was promoting it.
- (24) It's just having different types there,
- (25) but always modifying, even in the front end, pointing

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- (1) out that our products under development were cost
- (2) effective and provided even the same features as the
- (3) VAFC; and that two megabytes wasn't a minimum
- (4) required memory to do such a thing.
- (5) Q This shared frame buffer, is that the same
- (6) shared buffer that's present in the 5440?
- (7) MR. JACOBS: Objection, vague and
- (8) ambiguous. What shared buffer?
- (9) MS. KORDZIEL: The one that's referred to
- (10) here.
- (11) MR. JACOBS: It's referred to in a couple
- (12) places.
- (13) MS. KORDZIEL: Shared frame buffer
- (14) solution.
- (15) MR. JACOBS: In the print?
- (16) MS. KORDZIEL: Uh-huh.
- (17) THE WITNESS: The shared frame buffer
- (18) solution right next to the Trident VAFC -- I don't
- (19) believe was exactly the same shared frame buffer. In
- (20) fact, it could not have been exactly the same shared
- (21) buffer as the 5440, because the 5440 was not
- (22) announced at that point, was not known to Trident,
- (23) and its method -- only the term "shared-frame buffer"
- (24) was being used.
- (25) Q (By Ms. Kordziel): How was your

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- (1) shared frame buffer in the 5440 different from the
- (2) Trident - the shared frame buffer solution, and also
- (3) the Trident VAFC solution and the shared frame buffer
- (4) solution? How is your shared frame buffer different?
- (5) A Well, I guess we're back to that again. I
- (6) don't recall what this was - actually what it meant
- (7) in terms of shared frame buffer solution, so since I
- (8) don't know what it meant specifically on how it used
- (9) the shared frame buffer, I can't say how we're
- (10) different.
- (11) Q How were you able to make a comparison? You
- (12) compared the 5440 then, the shared frame buffer
- (13) solution.
- (14) A When it - two copies of the same page. Excuse
- (15) me.
- (16) Well, specifically, even this column
- (17) that talks about shared frame buffer solution, right
- (18) there, showing video scaling controller as a \$20
- (19) component, as another item that does the video
- (20) scaling and the video processing as a separate
- (21) device. And the 5440, it says, "Not needed - built
- (22) in." It takes care of the video scaling.
- (23) Q Was that a separate device? Because it has a
- (24) clock as being \$2, a BIOS as being \$1. I mean I
- (25) would assume all this would be on the same board?

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- (1) A The same board, yes; not the same chip. This
- (2) was also at a point where Trident did not have any
- (3) highly integrated VGA.
- (4) So as my column is showing, LUT-DAC, Look
- (5) Up Table DAC, DAC is being called as some cost here.
- (6) It was just integrated into the Trident. Okay, that
- (7) part did have an integrated DAC. We have an
- (8) integrated DAC. The clock was integrated. I don't
- (9) know why they put clock dollars on this other shared
- (10) frame buffer solution. That's just their marketing
- (11) propaganda.
- (12) Q But isn't that the function of marketing, how
- (13) you break down the costs?
- (14) A No. In this specific case they were looking at
- (15) something else that didn't have integration even to
- (16) the level of the Look Up Table DAC, ignoring anybody
- (17) who might have had something, shared frame buffer
- (18) solution at that point being a concept promoted by
- (19) Intel looking at more generic devices that had just
- (20) separate components and had specifically a separate
- (21) video scaling device with it externally. Even
- (22) Trident has to have external.
- (23) MS. KORDZIEL: Let's mark this next
- (24) document, Exhibit 20.
- (25) (Marked for identification: Respondent's

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- (1) Exhibit Number 20.)
- (2) MS. KORDZIEL: Let's go off the record
- (3) and take five minutes or so.
- (4) (A recess was taken.)
- (5) Q (By Ms. Kordziel): Back on the
- (6) record.
- (7) Can you identify Exhibit 20?
- (8) A Yes, I can.
- (9) Q This was the PCI multimedia design that you
- (10) were involved with?
- (11) A PCI multimedia committee propaganda.
- (12) Q Can you turn to the page bearing Bates number
- (13) 11266? On the section 3.2, "Dealing with Different
- (14) Pixel Representations" -
- (15) A Uh-huh.
- (16) Q - the second sentence there says, "The
- (17) mechanism relies upon the concept of 'apertures' to
- (18) support multiple, simultaneous views of a shared
- (19) pixel 'buffer'."
- (20) What is your understanding of that
- (21) sentence?
- (22) A I have to read the rest of it.
- (23) Well, it's different - different
- (24) locations to end up being the same physical location
- (25) in the memory, but to be treated differently

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- (1) depending upon the address that data came from.
- (2) Q So you could have dual apertures, for example,
- (3) an aperture for YUV data, an aperture for RGB data?
- (4) A Yes.
- (5) Q Did the Cirrus products ever incorporate the
- (6) concepts described here in any of their products?
- (7) A Well, there's a lot of concepts here.
- (8) Q The concepts of the two apertures.
- (9) A Well, a lot of the Cirrus products definitely
- (10) incorporated the part of 3.2.3, which was on the 268,
- (11) this "Endian-ness Conversion."
- (12) Q Which products include that, the Endian-ness
- (13) Conversion?
- (14) A Only in the PCI bus devices, so that would only
- (15) be in the Alpine family. I think we did it first in
- (16) the 5436 to deal with the different ordering of bytes
- (17) across the bus, different processors.
- (18) The 5440 and the 5446 used some aperture
- (19) ranges to deal with looking at YUV data in some
- (20) aspects, the 40 for this Pack format to be able to
- (21) detect it from a specific address range and operate
- (22) on it. The 46 used it for also some YUV format
- (23) recognition.
- (24) Q Going up to section 3.2.1, "Apertures," did the
- (25) Cirrus products include this concept of having

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- (1) apertures for RGB data and apertures for YUV data?
- (2) A Which part are you - ask that again.
- (3) Q Regarding the apertures, did any of Cirrus's
- (4) products have apertures for the video YUV data and
- (5) apertures for graphics RGB data?
- (6) A All the products had apertures for RGB
- (7) graphics. That was the main way they were
- (8) addressed. So the 5440 had an aperture to recognize
- (9) the special Packed format. The 5446 had apertures to
- (10) recognize a YUV planar format, when we ordered the
- (11) parts.
- (12) Q On the front page it says November 10, 1993.
- (13) That was the date of this fax to you, I assume?
- (14) A Uh-huh.
- (15) Q After your meetings, did you ever talk with
- (16) other people at Cirrus regarding things discussed in
- (17) this PCI multimedia design guide?
- (18) A Yes. This was shared with other people at
- (19) Cirrus.
- (20) Q Did you ever discuss this with Robert Nally or
- (21) John Schafer?
- (22) A This directly? Probably not. Texas -.
- (23) Q So usually you didn't have discussions with
- (24) people in Texas regarding your standards committee
- (25) meetings then?

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- (1) A Not very often on a direct basis. Just went
- (2) through other channels to -.
- (3) MS. KORDZIEL: Let's have this marked
- (4) Exhibit 21.
- (5) (Marked for identification: Respondent's
- (6) Exhibit Number 21.)
- (7) Q (By Ms. Kordziel): Can you identify
- (8) this document?
- (9) A Nope.
- (10) Q Is this the shared frame buffer spec that you
- (11) mentioned that Intel was proposing?
- (12) A Doesn't look like it. I don't know. I never
- (13) saw it.
- (14) Q What was the shared frame buffer solution you
- (15) mentioned earlier that Intel was working on?
- (16) A This PCI multimedia spec (indicating). That
- (17) was the shared frame buffer, just the idea of using
- (18) the PCI bus for all the data and putting it all into
- (19) one - one buffer.
- (20) Q And so you're not familiar with the shared
- (21) frame buffer spec that was developed by ATI and
- (22) Intel?
- (23) A This wasn't shared with other people.
- (24) Q You're not aware of it?
- (25) A No.

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- (1) MS. KORDZIEL: Let's have this marked
- (2) Exhibit 22.
- (3) (Marked for identification: Respondent's
- (4) Exhibit Number 22.)
- (5) Q (By Ms. Kordziel): Can you identify
- (6) Exhibit 22?
- (7) A Yes.
- (8) Q Have you ever seen this document before?
- (9) A I think so. Came as part of the VESA video
- (10) interface committee meetings.
- (11) Q If you'd turn to page 17576 -
- (12) A Uh-huh.
- (13) Q - and it says there "Memory-attach approach."
- (14) Under the first bullet point, "Single Frame Buffer
- (15) solution is possible."
- (16) A Uh-huh.
- (17) Q What was your understanding of that statement?
- (18) A That contrasted to the so-called DAC attached
- (19) approach which meant that all the video was in one
- (20) frame buffer and some other device and graphics was
- (21) in a frame buffer with the graphics device. This
- (22) memory attach part was to eliminate one extra piece
- (23) of memory in a system.
- (24) Q So the graphics and the video would be sharing
- (25) the same frame buffer?

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- (1) A Yes.
- (2) Q Did you ever discuss the VESA VAFC or VESA
- (3) Media Channel options with Robert Nally or John
- (4) Schafer?
- (5) A Yes, I said the - the same standards
- (6) considerations we talked about previously, so we had
- (7) to incorporate it for compatibility where possible in
- (8) our products.
- (9) MS. KORDZIEL: Let's have this marked
- (10) Exhibit Number 23.
- (11) (Marked for identification: Respondent's
- (12) Exhibit Number 23.)
- (13) MS. KORDZIEL: Counsel, do you have the
- (14) original copy of these documents?
- (15) MR. JACOBS: I don't have the faintest
- (16) idea sitting here today.
- (17) MS. KORDZIEL: The way it was copied, the
- (18) date on this - the date can't be ascertained. Can
- (19) you send us another copy, or actually just the first
- (20) page?
- (21) MR. JACOBS: I suspect this is a copy of
- (22) a copy.
- (23) THE WITNESS: A copy of a copy.
- (24) MR. JACOBS: Just looking at it, it
- (25) doesn't look like a copy of the original.

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- (1) MS. KORDZIEL: If you can find the
- (2) original at Cirrus, we would like to have that
- (3) produced.
- (4) MR. JACOBS: This is what number are we
- (5) on now?
- (6) MS. KORDZIEL: 23. If they want, they
- (7) can just photocopy and fax us the first page. I just
- (8) need the first page to get the date.
- (9) Q (By Ms. Kordziel): If you turn to
- (10) the Bates 49738 -
- (11) A Okay.
- (12) Q First, can you identify this document?
- (13) A Not exactly. It looks like one of Cirrus's
- (14) sort of everything product brochures.
- (15) Q This was something that was given to customers?
- (16) A This would have been like a - yeah, a general
- (17) handout of the company's product line.
- (18) Q Looking under the section entitled "5440," what
- (19) does it mean by the "Unique 32-bit multimedia frame
- (20) buffer"?
- (21) MR. JACOBS: Objection, lacks
- (22) foundation, calls for speculation.
- (23) THE WITNESS: It's rather like a
- (24) marketing bullet that is meant to mean whatever you
- (25) can get the - some person viewing it to think it may

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- (1) mean for the purposes of marketing it.
- (2) Q (By Ms. Kordziel): Would it be the
- (3) multi-format frame buffer?
- (4) MR. JACOBS: Same objections.
- (5) THE WITNESS: It - it - it could mean
- (6) almost anything. It's just a marketing statement
- (7) saying, "It's great."
- (8) Q (By Ms. Kordziel): Can you turn to
- (9) Bates number 49741?
- (10) A 49 -
- (11) Q Do you know what product the 7543 referred to?
- (12) What was the product name?
- (13) A I have no idea.
- (14) Q Under where it says, "MVA, MotionVideo
- (15) Acceleration," and it says, "Multi-format frame
- (16) buffer," and "True-color full motion video playback."
- (17) A Uh-huh.
- (18) Q Was the 7543 one of the Madderhorn products
- (19) perhaps that was covered by the "525 Patent"?
- (20) MR. JACOBS: Objection, lacks foundation,
- (21) calls for speculation.
- (22) THE WITNESS: There was a - no
- (23) correspondence between a name and a product number.
- (24) This is really a laptop control that has some video
- (25) features. The same brochure as the 40, so it existed

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- (1) at least at that time or afterwards.
- (2) Q (By Ms. Kordziel): From reading this
- (3) description, can you tell whether or not it had the
- (4) functionality that was present in the 5440?
- (5) MR. JACOBS: "It" being the 43?
- (6) MS. KORDZIEL: Yes, meaning the 7543.
- (7) THE WITNESS: Actually not definitively,
- (8) no.
- (9) Q (By Ms. Kordziel): But it does show
- (10) a - state a multi-format frame buffer?
- (11) A Similar statements have been made about the
- (12) Laguna 62 at some point, and it certainly did not
- (13) have the same method of dealing with that frame
- (14) buffer as the 40 did. So I can't say exactly what
- (15) this was similar to.
- (16) Q Okay. Was this capable of back end processing,
- (17) video processing?
- (18) MR. JACOBS: "This" again is the 7543?
- (19) MS. KORDZIEL: 7543.
- (20) MR. JACOBS: Lacks foundation, calls for
- (21) speculation.
- (22) THE WITNESS: Again, this is all we
- (23) have. We can only guess as to which product it was
- (24) and how it accomplished it.
- (25) MS. KORDZIEL: This has already been

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- (1) marked. It was marked as Respondent's Exhibit 11.
- (2) So we're not going to mark it again.
- (3) MR. JACOBS: Okay.
- (4) Q (By Ms. Kordziel): Can you identify
- (5) this document?
- (6) A Yeah. Yes.
- (7) Q Have you seen this document before?
- (8) A This particular one? There's a possibility,
- (9) but I -
- (10) Q Can you turn to the document bearing Bates
- (11) number 19838 dot 0049?
- (12) A 198 - 49. Okay.
- (13) Q Can you point out to me the - the front end
- (14) video processing from this diagram of the 5462?
- (15) A Not shown in this document, this diagram.
- (16) Q Excuse me?
- (17) A It's not made specific in this diagram. I
- (18) can't - I can't point it out the way I'm looking at
- (19) it.
- (20) Q When the memory of the data, either video or
- (21) graphics, is inputted in this device, where is it
- (22) actually tagged?
- (23) A Which - where does it say tagged?
- (24) Q Remember, we talked about the RAM bus being a
- (25) 9-bit memory device, and that the ninth bit would tag

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- (1) the memory, tag the data as being video or graphics?
- (2) A Where that took place, how, I couldn't say
- (3) since that wasn't my product line. I knew that bit
- (4) got used for something, wasn't all that specific.
- (5) Q If the video and graphics data was in the same
- (6) format, what was the purpose of the tagging?
- (7) MR. JACOBS: Asked and answered, I
- (8) believe.
- (9) THE WITNESS: If they were in the same
- (10) format -- I didn't know that the tagging was used, so
- (11) I don't --
- (12) Q (By Ms. Kordziel): I thought you had
- (13) testified earlier that the data was in the same
- (14) format, stored in the frame buffer, and there was a
- (15) tagging to distinguish whether or not it was video or
- (16) graphics.
- (17) A No. I was saying I thought I recalled it doing
- (18) something that actually distinguished two formats
- (19) that had to be similar, at least be of limited
- (20) flexibility.
- (21) Q What do you mean by that?
- (22) A They had to be the same number of bytes per
- (23) pixel or something, even though the interpretation of
- (24) bits within those bytes could be made different based
- (25) on the tag or something.

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- (1) But as I said, since I didn't make use
- (2) of that feature or get involved with it, my
- (3) recollection of that is not very precise at all.
- (4) Q Do you remember when data is stored in the
- (5) frame buffer whether or not it's in its native YUV
- (6) and RGB formats?
- (7) MR. JACOBS: In the 62?
- (8) Q (By Ms. Kordziel): Yes, in the 5462.
- (9) A Data could be placed in the frame buffer at one
- (10) point in time in its native format. So that's --
- (11) that's not an answer?
- (12) Q So it does store YUV and RGB data?
- (13) A Yes, it can go there, yes.
- (14) Q I guess from earlier I thought we had said the
- (15) frame buffer stored video and graphics data in the
- (16) same format.
- (17) A The display -- the part that's the on-screen
- (18) area was the same format together. And the front end
- (19) processor function read the data from one location of
- (20) the -- in this case the RAM bus area, did the video
- (21) conversion, and wrote it back out to the same RDRAM
- (22) in a different area that was part of the on-screen
- (23) space.
- (24) Q I see. So the front end video processing read
- (25) the data, data was first stored in the frame buffer

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- (1) in YUV or RGB formats; is that correct?
- (2) A Yes.
- (3) Q Then the front end video processing would read
- (4) the data, convert it to a single format, and then
- (5) store it back in the frame buffer?
- (6) A In the area of the active display, yes.
- (7) Q Will you turn to the Bates dot 0051?
- (8) MR. JACOBS: A couple of pages.
- (9) THE WITNESS: Yes, I know, I have to
- (10) switch position.
- (11) Q (By Ms. Kordziel): Under the section
- (12) 3.2.7, "Video Pipeline," it says that the video --
- (13) "The 5462 video pipeline is the data packed from the
- (14) memory to the RAM DAC. It contains the YUV to RGB
- (15) data converter." Would that be a front end or back
- (16) end processing?
- (17) A This doesn't look like it would be processing
- (18) as such, so I can't say it's front end or back end.
- (19) If the 62 didn't have the back end processing in the
- (20) manner of the 40, but -- so the documents about it
- (21) didn't make things very clear as to exactly where --
- (22) where it took place.
- (23) Q What constitutes back end processing?
- (24) MR. JACOBS: As he's using it now?
- (25) THE WITNESS: As --

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- (1) Q (By Ms. Kordziel): How are you
- (2) defining back end processing?
- (3) A Okay. In the 5440, the video data would be
- (4) read from some off-screen area of memory and sent --
- (5) color space converted and scale zoomed as part of its
- (6) pipeline, and then sent out to -- potentially to the
- (7) D/A converter to be selected on a pixel basis between
- (8) that processed video and the graphics data that was
- (9) simultaneously being read from the on-screen
- (10) memory --
- (11) Q Because it says --
- (12) A -- in two different pipelines. This does say
- (13) one video pipeline in the data path that contains
- (14) both of these. That would be back to at least --
- (15) something could switch this based on this tagged bit
- (16) that could -- if the same data it was reading was
- (17) all -- averaged 16 bits per pixel, one set of 16 bits
- (18) could be considered video and the next set of 16 bits
- (19) sequentially in that same pipe could be called RGB.
- (20) And that's all in the same pipeline and not scaled.
- (21) This doesn't -- it's not scaling or
- (22) changing the quantity of data of the YUVs
- (23) independently of the graphics data.
- (24) Q So I guess under your definition, if there's
- (25) color space conversion but no scaling, then that

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- (1) wouldn't be a back end video processor?
- (2) MR. JACOBS: Objection, mischaracterizes
- (3) the testimony.
- (4) THE WITNESS: Color space conversion
- (5) alone would not be sufficient to be -- I would call a
- (6) back end video processor.
- (7) Q (By Ms. Kordziel): So the 5462
- (8) doesn't have back end video processing?
- (9) MR. JACOBS: Objection, asked and
- (10) answered.
- (11) THE WITNESS: I've said it doesn't have
- (12) video -- back end video processing.
- (13) Q (By Ms. Kordziel): So although it
- (14) has a color space converter, under your definition,
- (15) that would not be back end processing?
- (16) A That's what I said.
- (17) Q Okay. You mentioned that there were a few
- (18) reasons why the data was tagged. What were some of
- (19) those reasons? Can you elaborate on that?
- (20) MR. JACOBS: Again, 5462?
- (21) Q (By Ms. Kordziel): The 5462.
- (22) A No, I can't elaborate any further because then
- (23) I'm just making guesses from what I -- from a hazy
- (24) memory of a feature that didn't get even used a lot
- (25) but was just talked about.

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- (1) Q The 5465, that's when there was -- back end
- (2) video processing was implemented; is that correct?
- (3) A Yes.
- (4) Q Did the 5665 also have the tagged memory, or
- (5) was that eliminated?
- (6) MR. JACOBS: 5465?
- (7) Q (By Ms. Kordziel): 5465.
- (8) A The 5465 no longer supported 9-bit RDRAM.
- (9) Q What kind of memory did it have?
- (10) A Just the standard 8-bit-wide RAM bus.
- (11) Q This document was marked Respondent's Exhibit
- (12) 7. Turn to Exhibit 7.
- (13) A Oh.
- (14) Q Can you identify this document?
- (15) A Yeah, in general.
- (16) Q What is it?
- (17) A This is just the preliminary -- the early data
- (18) book for some of the Cirrus graphics chips that would
- (19) be available to any customer or anybody.
- (20) Q The 543X and the 4X?
- (21) A That version of family at the time was known by
- (22) those product numbers, 40, 34, 36, 30.
- (23) Q If you'd turn to the next page, under where it
- (24) says, "Unique 32-bit multimedia frame buffer," what
- (25) does it mean when it says, "allows different color

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- (1) depths between video and graphics?"
- (2) A The second page says that? There it is.
- (3) Q Yes.
- (4) A It says mixing YUV and RGB so that the graphics
- (5) could have 8 bits per pixel and the video could have
- (6) 16 bits per pixel or YUV.
- (7) Q That's just another way of saying -- storing
- (8) YUV and RGB data in the same frame buffer?
- (9) A Yes.
- (10) Q On the front page there's a -- with respect to
- (11) the 5440, there's a block that says the Pixel 2070,
- (12) 2085, TV decoder. What was that? The 2070 --
- (13) MR. JACOBS: Where are you?
- (14) MS. KORDZIEL: The very bottom on the
- (15) diagram.
- (16) MR. JACOBS: Do you see it?
- (17) THE WITNESS: I'm not sure. It looks
- (18) more like it's something that might have been written
- (19) partly in error.
- (20) Q (By Ms. Kordziel): Why is that?
- (21) A There was under development a Pixel single chip
- (22) TV decoder that looked similar to some other TV
- (23) decoders, but I don't think it had a number looking
- (24) like that. The 2070 was that same video processor
- (25) device that went with the 2080, and there was a 2085,

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- (1) too, just a different version of the same DAC for it.
- (2) Q Was this video port that received the
- (3) real-time video data?
- (4) A For the 5440 support, a TV decoder, that was to
- (5) go to a video port. It was supposed to be a TV
- (6) decoder, but the product never -- I think --
- (7) incorrect.
- (8) MR. JACOBS: Could you read back that
- (9) answer or at least what you got of it.
- (10) (The record was read by the reporter.)
- (11) THE WITNESS: Okay. I will try that
- (12) again. Something like that doesn't sound like an
- (13) answer.
- (14) The 5440 had a video port to get
- (15) real-time video data from a TV decoder chip. There
- (16) was a TV decoder chip being developed for Pixel, but
- (17) it did not have a number exactly like the one
- (18) indicated here.
- (19) Q (By Ms. Kordziel): Going back to the
- (20) second page under the bullet, "Unique 32-bit
- (21) multimedia frame buffer," how is it able to be
- (22) operated with the 512 kilobyte with the one megabyte
- (23) or the two megabyte DRAM?
- (24) A What do you mean, operated?
- (25) Q Was there a difference -- with the smaller

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- (1) frame buffer, were there any differences between the
- (2) 5440 when it was used with a smaller DRAM versus a
- (3) larger DRAM?
- (4) A Well, of course there would be differences in
- (5) operation given the limitations of the size of the
- (6) memory. There would be a lot of -- I mean a number
- (7) of differences on the possible resolutions that could
- (8) be supported on the screen because they take more
- (9) memory.
- (10) All this could be interpreted to mean is
- (11) that even with the smallest supporting memory, it
- (12) still allowed for multi-format frame buffer support
- (13) within the constraints of how much storage there was.
- (14) Q With smaller storage -- smaller memory, would
- (15) the video graphics be stored on-screen? Was that how
- (16) it met the smaller frame buffer limitation?
- (17) MR. JACOBS: Objection, ambiguous.
- (18) Could you read that back?
- (19) (The record was read by the reporter.)
- (20) THE WITNESS: No.
- (21) Q (By Ms. Kordziel): How did it meet
- (22) it?
- (23) A Okay. What's the question again? How did it
- (24) do what?
- (25) Q How did it operate with the smaller frame

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- (1) buffer memory?
- (2) A With a smaller amount of memory, it only
- (3) supported smaller resolutions on the screen or lower
- (4) color depths for the graphics.
- (5) MS. KORDZIEL: Let's take a short break
- (6) and go off the record.
- (7) (A recess was taken.)
- (8) MS. KORDZIEL: Let's go back on the
- (9) record. You can mark this as Exhibit 24.
- (10) (Marked for identification: Respondent's
- (11) Exhibit Number 24.)
- (12) Q (By Ms. Kordziel): At the very
- (13) bottom there, if you look under Alpine CDX, it says,
- (14) "Waiting on customer feedback to determine scope of
- (15) WavePort support in Alpine CDX."
- (16) Q Does that refresh your recollection regarding
- (17) any customer discussions?
- (18) MR. JACOBS: With respect to WavePort?
- (19) Q (By Ms. Kordziel): That's right.
- (20) A Can I ask a question? Why are we asking
- (21) questions about WavePort anyway?
- (22) Q Well, I'm interested in the discussions they
- (23) had, that Cirrus had with customers regarding the
- (24) Alpine CDX in general, and then this mentions the
- (25) WavePort support. But I'm interested in any customer

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- (1) visits.
- (2) A Okay. Still, it is my recollection that we
- (3) really had no real customer feedback about WavePort
- (4) specifically, because it -- it was not directly
- (5) related to graphics, it was a feature that we tried
- (6) to promote relative to Crystal products, and it
- (7) didn't receive any particular enthusiasm in brief
- (8) mentions to customers, so it didn't get incorporated.
- (9) Q Do you remember any discussions with customers
- (10) regarding the Alpine CDX during this time frame of
- (11) January 1994?
- (12) A WavePort -- no. WavePort got discussed with
- (13) customers as an idea as a separate feature from any
- (14) specific graphics products that could incorporate
- (15) it. So it was not discussed in the context of Alpine
- (16) CDX, just as a feature that we thought customers
- (17) might find valuable.
- (18) Q Now I believe my question was directed just to
- (19) the Alpine CDX. Do you remember any customer
- (20) discussions regarding the Alpine CDX during this time
- (21) frame of January 1994?
- (22) A Then the answer is no.
- (23) Q Do you remember any customer discussions that
- (24) you participated in regarding the Alpine CDX during
- (25) the late 1993 or early 1994 time frame?

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- (1) A Specifically, I don't recall either way.
- (2) Q Are you being compensated for the time today?
- (3) You had mentioned earlier that your rate was \$150 per
- (4) hour for working with Richard Ferraro. Will you be
- (5) compensated for today?
- (6) A I hope so, somewhere. I mean -- I asked once
- (7) if I would be, and it's my understanding that my time
- (8) will be paid for.
- (9) MS. KORDZIEL: Okay. Well, I have no
- (10) further questions. We can go off the record.
- (11) MR. JACOBS: Just a couple of things.
- (12) Could you mark the transcript as confidential
- (13) business information of Cirrus Logic, please? And
- (14) the witness will be afforded -- provided with an
- (15) opportunity to review the transcript as well.
- (16) I have no questions.
- (17) (Whereupon, at 4:50 p.m., the deposition
- (18) of David A. Keene was adjourned.)
- (19) _____
- (20) DAVID A. KEENE

[illegible]

0306

1

1 STATE OF CALIFORNIA)

2

ss.

2 COUNTY OF SANTA CLARA)

3

3 I, Joann Ruth Weber, a Certified Shorthand

4

4 Reporter in and for the State of California, hereby

5

5 certify that the witness in the foregoing deposition,

6

6 DAVID A. KEENE,

7

7 was by me duly sworn to tell the truth, the whole

8

8 truth, and nothing but the truth in the

9

9 within-entitled cause, that the foregoing is a

10

10 full, true and correct transcript of the proceedings

11

11 had at the taking of said deposition to the best of

12

12 my ability.

13

13

14

14 Joann Ruth Weber, CRR 2615

15 Date: November 10, 1998

16

16

17

17 The deponent personally appeared before me on

18

18

19

19 The ____ day of _____, 19____ and was

20

20

21

21 given the opportunity to read the deposition, and

22

22

23

23 thereafter signed it on the same day.

24

24

25

25 Upon completion of the foregoing transcript, the

26

26

27

27 witness was notified it was ready for signature, but

28

28

29

29 the deposition was not signed by the witness for the

30

30

31

31 following reason: _____

<p>\$</p> <p>\$1 182:24</p> <p>\$150 11:10; 205:3</p> <p>\$2 182:24</p> <p>\$20 182:18</p> <p>25 172:25</p> <p>525 130:16,20,23; 131:2; 135:3; 168:14; 170:18; 171:18; 173:18; 179:1; 191:19</p> <p>64 172:25</p> <p>70 11:19</p> <p>78 13:8</p> <p>864 173:17; 174:22; 176:22; 179:20</p> <p>89 15:16; 19:9</p> <p>9 13:8</p> <p>93 45:14; 113:20,21; 132:21; 149:3,4</p> <p>94 45:14</p> <p>95 64:11,14</p> <p>'apertures' 184:17</p> <p>'buffer' 184:19</p> <p>'MediaBus' 112:18</p> <p>'on 131:13; 132:10,18; 134:22</p> <p>0</p> <p>000467 5:4</p> <p>0049 193:11</p> <p>0051 196:7</p> <p>00614 3:17</p> <p>00758 4:20</p> <p>00797 3:19</p> <p>00951 3:9</p> <p>01012 3:10</p> <p>011283 4:23</p> <p>017580 5:6</p> <p>02195 4:3</p> <p>02228 5:10</p> <p>028014 4:16</p> <p>1</p> <p>1 3:5; 6:22,25</p> <p>1.0 3:17</p> <p>1.1 110:5</p> <p>10 3:22; 4:21; 5:6; 149:22,24; 155:17; 186:12</p> <p>100 1:23</p> <p>1007 110:4</p> <p>11 4:2; 155:6,8; 193:1</p> <p>11266 184:13</p> <p>12 3:17; 4:3,4,8; 5:8; 156:1,3</p> <p>13 3:7,14; 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UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, D.C. 20436

In the Matter of)
)
 CERTAIN VIDEO GRAPHICS DISPLAY)
 CONTROLLERS AND PRODUCTS)
 CONTAINING SAME) Inv. No. 337-TA-412

CONFIDENTIAL

DEPOSITION OF ROBERT V. DICKINSON

Date: Friday, December 4, 1998
 Time: 9:30 a.m.
 Location: FISH & RICHARDSON
 2200 Sand Hill Road, Suite 100
 Menlo Park, California 94025

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APPEARANCES:

For ATI FISH & RICHARDSON
 Technologies, Inc.: BY: LINDA LIU KORDZIEL, ESQ.
 601 15th Street N.W.
 Washington, D.C. 20005
 (202) 783-5070

For Cirrus Logic, MORRISON & FOSTER LLP
 Inc.: BY: DAVID M. LEVIN, ESQ.
 425 Market Street
 San Francisco, California 94105

11 (415) 368-6070

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Reported by: WEBER & VOLZING, INC.
 BY: Joann Ruth Weber, CMA
 License No. 2618
 60 South Market Street, Suite 770
 San Jose, California 95113
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16	THE WITNESS WAS INSTRUCTED NOT TO ANSWER THE
17	FOLLOWING QUESTION:
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18	Q (By Ms. Kordziel): *** Looking at
19	the picture on the first page, would you say that was
19	very similar to the picture that's shown on Cirrus
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- (1) ***CONFIDENTIAL***
 (2) -o0e-
 (3) ROBERT V. DICKINSON,
 (4) being duly sworn by the certified shorthand reporter
 (5) to tell the truth, the whole truth and nothing but
 (6) the truth, testified as follows:
 (7) EXAMINATION BY MS. KORDZIEL:
 (8) Q Good morning. My name is Linda Kordziel, and
 (9) I'm with Fish & Richardson. We represent ATI
 (10) Technologies in an investigation before the
 (11) International Trade Commission.
 (12) A Uh-huh.
 (13) Q Could you please state your name for the
 (14) record?
 (15) A It's Robert Dickinson.
 (16) Q Your address?
 (17) A My home address?
 (18) Q That's right.
 (19) A 8 Siskiyou Place, Menlo Park, California.
 (20) MR. KORDZIEL: I'd like to have this
 (21) marked as Exhibit 1.
 (22) (Marked for identification: Respondent's
 (23) Exhibit Number 1.)
 (24) Q (By Ms. Kordziel): Mr. Dickinson,
 (25) have you ever been deposed before?

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- (1) A Yes.
 (2) Q Do you understand this is a deposition noticed
 (3) of Cirrus Logic and you'll be testifying on behalf of
 (4) Cirrus?
 (5) A That's my understanding.
 (6) Q Have you seen this deposition notice before?
 (7) A I've seen attachment A. I don't recall if I've
 (8) seen the rest of it or not.
 (9) Q Are you prepared to testify as to the topics
 (10) listed on attachment A?
 (11) A To the -- I am, to the best of my personal
 (12) knowledge.
 (13) Q It's not supposed to be personal knowledge,
 (14) it's supposed to be with respect to Cirrus. And so
 (15) if there is something, would you be able to find out
 (16) that information during one of the breaks or
 (17) something?
 (18) MR. LEVIN: I'll object to that question
 (19) because it's ambiguous. Could you restate the
 (20) question? Are you asking whether he could gather
 (21) more information during the break?
 (22) MS. KORDZIEL: That's right. He
 (23) mentioned something about personal knowledge, but
 (24) it's not really based on Mr. Dickinson's personal
 (25) knowledge. It's supposed to be a deposition

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- (1) regarding Cirrus.
 (2) MR. LEVIN: Well, I'm sorry, I have to
 (3) object to that as well, because I don't see how he
 (4) could be expected to draw from anything other than
 (5) his personal knowledge. He's appearing of course on
 (6) behalf of Cirrus as a 30(b)(6) witness designated in
 (7) response to these deposition topics. But I have to
 (8) object to that question.
 (9) MS. KORDZIEL: That's fine. I just want
 (10) to make sure he's capable of testifying as to these
 (11) topics and he's knowledgeable on these topics.
 (12) THE WITNESS: I am -- I consider myself
 (13) to be knowledgeable about these topics to different
 (14) levels, depending on the specific nature of the
 (15) topic. And -- so I guess that's about all I can say
 (16) on that subject.
 (17) Q (By Ms. Kordziel): Okay. Let's
 (18) start off with your education.
 (19) A Uh-huh.
 (20) Q Where did you go to college?
 (21) A I have a Bachelor's degree from UC Berkeley and
 (22) a Master's from the University of Washington, and was
 (23) a Sloan fellow at the Stanford Graduate School of
 (24) Business.
 (25) Q What was your undergrad degree, the Bachelor's

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- (1) degree?
 (2) A In physics.
 (3) Q What was your first job after -- I guess the
 (4) Sloan fellowship at Stanford?
 (5) A Well, that didn't -- I should just clarify that
 (6) that didn't come immediately after my Master's
 (7) degree.
 (8) Q I see. What did you do after your Master's
 (9) degree then?
 (10) A After my Master's degree? I was a member of
 (11) the technical staff at the Singer Company, a division
 (12) of the Singer Company.
 (13) Q What is the Singer Company?
 (14) A Well, they were at that time a company that
 (15) manufactured sewing machines, but also was in a
 (16) number of other businesses. And the division that I
 (17) was working for was in information equipment.
 (18) Q What was the time frame? What year?
 (19) A 1964.
 (20) Q When did you leave the Singer Company?
 (21) A At the end of 1985.
 (22) Q What did you do after leaving Singer, the
 (23) Singer Company?
 (24) A I joined TRW.
 (25) Q What was your position at TRW?

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- (1) A I was director of product management for point
- (2) of sales systems.
- (3) Q When did you - what year did you start at TRW?
- (4) A At the beginning of 1986. Excuse me. I
- (5) skipped a decade in there. Those last dates should
- (6) be '70's. I joined - I left Singer in '75 and
- (7) joined TRW in '76.
- (8) Q How long were you at TRW?
- (9) A For just under three years.
- (10) Q What did you do after leaving TRW?
- (11) A I joined System Development Corporation.
- (12) Q What were your responsibilities at System
- (13) Development Corporation?
- (14) A I was vice-president of engineering for their
- (15) products group.
- (16) Q What kind of products did System Development
- (17) Corp make?
- (18) A System Development Corporation as a whole was
- (19) primarily in software in large, complex systems. The
- (20) portion of the company that I was in was making -
- (21) developing office automation equipment.
- (22) Q When did you leave System Development
- (23) Corporation?
- (24) A Well, in I believe it was 1980, System
- (25) Development Corporation was acquired by Burroughs.

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- (1) and so at that time I became an employee of
- (2) Burroughs.
- (3) Q What were your duties at Burroughs?
- (4) A Vice-president and general manager of a
- (5) division called text management systems.
- (6) Q What is text management systems?
- (7) A It included word processing equipment and also
- (8) text filing and retrieval systems.
- (9) Q How long were you at Burroughs?
- (10) A I left Burroughs in early 1983.
- (11) Q Where did you go after leaving Burroughs?
- (12) A I went to Zilog.
- (13) Q What was your position at Zilog?
- (14) A Vice-president and general manager of the
- (15) systems division.
- (16) Q What area of technology is Zilog in?
- (17) A They are in the semiconductor business, and at
- (18) that time they were also making microcomputer
- (19) systems.
- (20) Q Were they involved in graphics controllers?
- (21) A Not to my recollection.
- (22) Q When did you leave Zilog?
- (23) A At the end of '83.
- (24) Q I thought you started at Zilog in '83.
- (25) A I did.

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- (1) Q So you were just there -
- (2) A I was there for less than a year.
- (3) Q Where did you go after that?
- (4) A To a company called Mouse Systems Corporation.
- (5) Q What were your responsibilities at Mouse
- (6) Systems Corporation?
- (7) A The president and CEO.
- (8) Q What area of technology was Mouse System
- (9) Corporation involved in?
- (10) A Pointing devices based on optical technology.
- (11) Q How long were you at Mouse Systems Corporation?
- (12) A Three years.
- (13) Q Where did you go after leaving Mouse Systems?
- (14) A Verticom, V-E-R-T-I-C-O-M.
- (15) Q What was your position at Verticom?
- (16) A President and CEO.
- (17) Q What area of technology was Verticom involved
- (18) in?
- (19) A Graphics controllers.
- (20) Q Who were some of Verticom's customers at that
- (21) time?
- (22) A Verticom's customers were typically architects
- (23) and engineers who bought through dealers, so we
- (24) actually sold to the dealer, and then they resold to
- (25) an end customer.

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- (1) Q Did Verticom also - was Verticom also involved
- (2) in video controllers?
- (3) A It's Verticom.
- (4) Q Excuse me?
- (5) A Verticom, C-O-M.
- (6) Q Oh, I'm sorry, Verticom.
- (7) A No.
- (8) Q How long were you at Verticom?
- (9) A Verticom was acquired by Western Digital in the
- (10) summer of 1987 - let's see - summer of '88, which
- (11) was roughly a year-and-a-half after I joined them.
- (12) And so then I became an employee of Western Digital
- (13) Corporation.
- (14) Q What were your responsibilities at Western
- (15) Digital?
- (16) A My first assignment there was vice-president
- (17) and general manager of the graphics division.
- (18) Q Were you involved in the day-to-day engineering
- (19) activities or was it a very-high level managerial
- (20) position?
- (21) A Well, the engineering group reported to me, but
- (22) I wasn't doing the engineering personally.
- (23) Q Were you also in charge of the marketing and
- (24) sales of Western Digital's graphics division?
- (25) A The marketing but not the sales.

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- (1) Q How long were you at Western Digital?
- (2) A Until the end of 1992.
- (3) Q While at Western Digital, were you in charge of
- (4) any graphics video controllers?
- (5) A Not to my recollection.
- (6) Q So it was only graphics controllers?
- (7) A That's my recollection.
- (8) Q What did you do after leaving Western Digital
- (9) at the end of 1992?
- (10) A I joined Cirrus Logic.
- (11) Q What was your position?
- (12) A My initial position was vice-president of Japan
- (13) business development.
- (14) Q Were you located in Japan?
- (15) A No.
- (16) Q So you were based in Fremont?
- (17) A Correct.
- (18) Q What were some of your day-to-day
- (19) responsibilities as vice-president of the Japan
- (20) business development?
- (21) A Well, my responsibility was achieving growth in
- (22) the sales of the company's products in Japan.
- (23) Q Who were some of the Japanese customers that
- (24) you were targeting at that time?
- (25) A NEC, Fujitsu, IBM Japan would probably be

- (1) A Let's see. Kimeo Fuji, Takeo Wada, Kenji
- (2) Shoda, and Kyle Baker.
- (3) Q Were there any particular products that you
- (4) were in charge of when you were vice-president of the
- (5) Japan business development?
- (6) A Could you clarify what you mean?
- (7) Q For example, were you in charge of portable
- (8) products or desktop products or other areas of the --
- (9) or all products in general with respect to Japan?
- (10) A All products with respect to Japan except --
- (11) except for wireless.
- (12) Q After the three years, what was your next
- (13) position?
- (14) A President of the graphics division.
- (15) Q What were some of your responsibilities as
- (16) president of the graphics division?
- (17) A Responsible for product definition, marketing,
- (18) product development, and scheduling and the
- (19) manufacturing process.
- (20) Q What products are encompassed under the
- (21) graphics division?
- (22) MR. LEVIN: Objection. Are you speaking
- (23) of a particular time period or --
- (24) MS. KORDZIEL: When he was president.
- (25) THE WITNESS: All of the desktop and

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- (1) the -- the most notable ones.
- (2) Q Who were some of the people working for you?
- (3) A By name or position or --
- (4) Q By name.
- (5) MR. LEVIN: I'm sorry, I'll object. Do
- (6) you have a time frame in mind?
- (7) MS. KORDZIEL: While he was -- we're
- (8) talking about the end of 1992 while he was
- (9) vice-president of Japan business development.
- (10) THE WITNESS: During -- during the period
- (11) that I had that position? Is that your question?
- (12) Q (By Ms. Kordziel): Well, how long
- (13) were you in that position?
- (14) A A little over three years.
- (15) Q Who were some of your direct reports?
- (16) A Again, clarifying, during that three-plus --
- (17) Q That's right.
- (18) A -- year period? Kimio Fuji, Takeo Wada, Keith
- (19) Okamoto, Kyle Baker, Kenji Shoda, Bill Knapp.
- (20) Q Were these people located in Japan or in
- (21) California?
- (22) A Most of them were in Japan.
- (23) Q Are these people still with Cirrus?
- (24) A Some of them are and some are not.
- (25) Q Which ones are still with Cirrus?

- (1) portable, at that time I guess they would be graphics
- (2) and video graphics controllers, and we still had a
- (3) few pure video products.
- (4) Q (By Ms. Kordziel): Who were some of
- (5) your direct reports when you were president of the
- (6) graphics division?
- (7) A Bill Housley -- I should clarify, by the way,
- (8) that I was actually co-president. There were two of
- (9) us that shared the responsibility.
- (10) Q Who was the other president, co-president?
- (11) A Bill Chu. So reports included Bill Housley,
- (12) Art Swift. Amazing how things slip away. Kyle
- (13) Baker, Jean McLaughlin, Rajan Kapur, and -- I mean
- (14) there are several others whose names I don't recall
- (15) at the moment.
- (16) Q Of the people that you've named, are they still
- (17) with Cirrus?
- (18) A I think only Kyle Baker of that group is still
- (19) with the company. Oh, Art Swift is as well.
- (20) Q As co-president of the graphics division, were
- (21) you also in charge of the Pixel Semiconductor
- (22) division?
- (23) A What was left of it, yes. It was no longer a
- (24) separate entity, and so the location and the -- the
- (25) people were part of the graphics division and the

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- (1) products were the responsibility of the graphics
- (2) division.
- (3) Q While you were vice-president of Japan business
- (4) development, did you also deal with the Pixel
- (5) Semiconductor division group?
- (6) A Yes.
- (7) Q How long were you co-president of the graphics
- (8) division?
- (9) A Just over one year.
- (10) Q What did you do after that?
- (11) A I assumed my current role, which is
- (12) vice-president of customer satisfaction.
- (13) Q What are your responsibilities as
- (14) vice-president of customer satisfaction?
- (15) A Broadly speaking, quality and business process
- (16) improvement.
- (17) Q Who is the current president of the graphics
- (18) division?
- (19) A The graphics division at the time that I
- (20) changed roles was merged into something called the PC
- (21) products division.
- (22) Q What is the PC products division?
- (23) A It was a combination of the graphics division,
- (24) our audio product line, and modems, and our modem
- (25) product line.

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- (1) Q In your current position as vice-president of
- (2) customer satisfaction, are you responsible for any
- (3) particular product lines, or is it just quality and
- (4) business process in general?
- (5) A I'm not responsible for any particular product
- (6) lines. It's a corporate role.
- (7) Q I see. That's your current position right now?
- (8) A That is my current position.
- (9) Q Are you familiar with the Nordic product line?
- (10) A Yes, I am.
- (11) Q That's referred to as the 7542 product; is that
- (12) correct?
- (13) A The 7542 is the Nordic product. "Nordic" was
- (14) also used as a broader term in terms of a family of
- (15) products, of which Nordic itself was the first.
- (16) Q When did development first start with respect
- (17) to the Nordic product?
- (18) A To the best of my recollection, it would have
- (19) been in the late -- late in 1993.
- (20) Q Who was involved in the Nordic development?
- (21) A From what standpoint?
- (22) Q Engineers, technical development.
- (23) A The lead engineer and architect was Vlad Brill.
- (24) Do you mind if I get a little more
- (25) coffee?

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- (1) MS. KORDZIEL: Oh, sure. We can go off
- (2) the record.
- (3) (A discussion was held off the record.)
- (4) Q (By Ms. Kordziel): We can go back on
- (5) the record.
- (6) I'm sorry, was there a question pending?
- (7) (The record was read by the reporter.)
- (8) Q (By Ms. Kordziel): Who else worked
- (9) on the project?
- (10) MR. LEVIN: Objection. I'm not sure it's
- (11) clear which project you're referring to.
- (12) Q (By Ms. Kordziel): We're talking
- (13) about the Nordic, the Nordic products.
- (14) A Again, from an engineering standpoint?
- (15) Q That's right.
- (16) A There was a -- a Russian engineer named Sasha,
- (17) whose last name I cannot recall. I believe that
- (18) Robin Han may have worked on aspects of Nordic. And
- (19) I don't offhand recall the names of any other
- (20) engineers who were working on the Nordic project.
- (21) Q Was the Nordic product based on any preexisting
- (22) Cirrus product?
- (23) A My recollection is that it was based to some
- (24) extent on a product called the 5428.
- (25) Q What was the functionality of the 5428?

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- (1) A It was --
- (2) MR. LEVIN: Objection, ambiguous as to
- (3) "functionality."
- (4) Q (By Ms. Kordziel): Do you understand
- (5) the question?
- (6) A Well, I understand the question using the term
- (7) "functionality" in the way that I would use it. I
- (8) don't know whether that's the way that you're using
- (9) it.
- (10) Q You can answer using the way you would view it.
- (11) A The way that I would describe the 5428 was that
- (12) it was a -- a graphics accelerator, and if I recall
- (13) correctly, it was what we would call a 16-bit
- (14) product.
- (15) Q Using your definition of functionality, what
- (16) was the functionality of the 7542?
- (17) A The 7542 was a notebook graphics controller
- (18) with -- with video capability.
- (19) Q Could it be used with desktop?
- (20) A I don't know of any reason why it couldn't be.
- (21) Q What was its video capability?
- (22) A Generally speaking, it had the ability to
- (23) receive video stream through a -- through a video
- (24) port, to store video data in the frame buffer, and to
- (25) display video data together with graphics, and

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- perform certain operations on the video data prior to
- (2) display. And that may not be complete, but that's my
 - (3) recollection of the core functions.
 - (4) Q What were the "certain operations" that it
 - (5) performed on the video data before the display?
 - (6) A They certainly included color space conversion
 - (7) and scaling. I don't recall whether they included
 - (8) de-interlacing or not.
 - (9) Q You mentioned that it stored data in a frame
 - (10) buffer. Was that a multiformat frame buffer?
 - (11) A My recollection is that it was a multiformat
 - (12) frame buffer.
 - (13) Q So it stored both video and graphics data in
 - (14) the frame buffer?
 - (15) A Yes, it stored both video and graphics data in
 - (16) the frame buffer.
 - (17) Q After retrieving the data from the frame
 - (18) buffer - strike that.
 - (19) You mentioned the video processing. Was
 - (20) that processing video data retrieved from the frame
 - (21) buffer?
 - (22) A Yes. My understanding was that when the data
 - (23) was retrieved from the frame buffer, it would go
 - (24) through a video pipeline where certain operations
 - (25) could be performed.

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- (1) Q What was the graphics - what processing of
- (2) graphics data did the 7542 have?
- (3) A The 7542 certainly had BitBLT, and it may
- (4) well - I don't recall specifically if there were
- (5) other graphics functions that it performed.
- (6) Q Did it have a color look-up table?
- (7) A It certainly had a color look-up table.
- (8) Q In this graphics processing, was processing of
- (9) graphics data retrieved from the frame buffer?
- (10) A Correct.
- (11) Q What other features did the 7542 have?
- (12) A Well, I think it had a lot of features at a
- (13) more detailed level.
- (14) Q The multimedia features then.
- (15) A Well, the multimedia features were basically
- (16) the video features that we talked about earlier.
- (17) Q Are there any other unique features of the
- (18) 7542?
- (19) MR. LEVIN: Objection to "unique" in
- (20) terms of - ambiguous as to "unique."
- (21) THE WITNESS: Yeah. What do you mean by
- (22) "unique"?
- (23) Q (By Ms. Kordziel): What was
- (24) difference, I guess, in the feature set between the
- (25) 5428 product versus the 7542?

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- (1) A Being a notebook graphics product, it had
- (2) support for LCD panels of various types, which the
- (3) 5428 did not. It had some power management
- (4) capability, which the 5428 did not. I think those
- (5) would be the major -.
- (6) Q Was there a video port for live video?
- (7) A Yes, I think I mentioned before that there was
- (8) a video port.
- (9) MR. LEVIN: I'm sorry, which product are
- (10) you talking about now?
- (11) Q (By Ms. Kordziel): The 7542.
- (12) A Yeah, that's what I'd assumed you were
- (13) referring to, so I'm glad that was clarified.
- (14) Q You had previously mentioned some names of
- (15) engineers who worked on the development. With
- (16) respect to the marketing of the 7542, can you
- (17) identify the names of some of the marketing and sales
- (18) people?
- (19) A Dennis Jow was one of the marketing people.
- (20) Bob Conner was one of the marketing people. In
- (21) terms of sales, certainly Kimio Fuji was involved
- (22) with Japanese customers. I think those are the
- (23) people that I have a clear recollection of. I'm sure
- (24) there were others.
- (25) Q During this time period, I take it you were the

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- (1) vice-president of Japan business development?
- (2) A Correct.
- (3) MR. LEVIN: Objection as to which time
- (4) period.
- (5) Q (By Ms. Kordziel): The time period
- (6) of the development of the 7542.
- (7) We'll come back and discuss more in
- (8) detail the 7542, but I'd like to go on and sort of
- (9) talk about the other products in the Nordic family to
- (10) get the overview.
- (11) A Uh-huh.
- (12) Q After the 7542, what was the next product?
- (13) A After the 7542, there were actually two
- (14) products, if I recall correctly, what we called
- (15) Nordic Lite, which would have been the 7541, and
- (16) Viking, which I believe was the 7543.
- (17) Q What time period was the Nordic Lite 7541
- (18) development?
- (19) A It would have been in 1994. I don't recall
- (20) more specifically than that.
- (21) Q What about the Viking?
- (22) A Basically the same - same time period.
- (23) Q Were these products based on the Nordic, the
- (24) 7542 product?
- (25) A Yes, they were.

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- (1) Q Turning first to the Nordic Lite 7541 product,
- (2) what were some of its key features?
- (3) A My recollection is that the Nordic Lite was
- (4) functionally the same as Nordic, except that it
- (5) removed the video functionality. And I believe it
- (6) was also a shrink, so that it was in a -- a finer
- (7) geometry process.
- (8) Q So the Nordic Lite did not have video
- (9) processing capabilities?
- (10) A That's my recollection.
- (11) Q What about the Viking, the 7543, what were some
- (12) of its key features?
- (13) A As I recall, the Viking had the same
- (14) functionality as Nordic, but again it was a shrink,
- (15) and therefore, had higher performance.
- (16) Q Did it have the video capabilities that were
- (17) present in the Nordic 7542 product?
- (18) A That's my recollection.
- (19) Q In some of the documents I've seen the
- (20) trademark "Motion Video Architecture" with respect to
- (21) the Nordic 7542 product. Are you familiar with that
- (22) term?
- (23) A Yes.
- (24) Q What does that term refer to?
- (25) A Well, from a marketing perspective, we wanted

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- (1) to label the fact that we were adding video
- (2) capability to the part. And that term was selected
- (3) as sort of a brand or a -- "brand" isn't the right --
- (4) exactly the correct term, but as a term that we could
- (5) use to promote that aspect of Nordic.
- (6) Q So when the "Motion Video Architecture"
- (7) terminology was used, what features, specific
- (8) features, would that encompass?
- (9) A I'm not sure I can give you a completely
- (10) precise answer to that, but I can tell you the gist
- (11) of it, if you will.
- (12) It was the ability to receive video data,
- (13) store it, process it and display it. And if I recall
- (14) correctly, we also included support for -- some
- (15) hardware support for decompression of one or two
- (16) compression algorithms under that -- under that
- (17) label.
- (18) Q Compression algorithms would be, for example,
- (19) like Accupak? Would that be a compression algorithm?
- (20) A Yes, I think if I recall correctly, Accupak
- (21) was originally called Sashapak, or -- no, actually I
- (22) don't think that is correct. It could have. I don't
- (23) recall specifically whether it did. Cinepak is one
- (24) that I do recall.
- (25) Q I see.

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- (1) A There were a lot of "paks" at that time.
- (2) Q Going back to the first feature, the ability to
- (3) receive video data, would that include receiving live
- (4) video data from a video port?
- (5) A Yes.
- (6) Q And the feature, storing the data, would that
- (7) include storing the video data with graphics data in
- (8) a multiformat frame buffer?
- (9) A Yes, it would.
- (10) Q What would the processing video data entail?
- (11) A Well, again, that would be primarily, I think,
- (12) color space conversion and scaling. But also the
- (13) decompression that I was talking about earlier, to
- (14) the extent that that was -- that that was included.
- (15) Q Were there any other features that Motion Video
- (16) Architecture would bring to your mind?
- (17) A Not at the moment.
- (18) Q After the 7543 product, what was the next
- (19) product?
- (20) MR. LEVIN: Objection, ambiguous. Are
- (21) you asking the next product in the Nordic family
- (22) or --
- (23) MS. KORDZIEL: That's right.
- (24) Q (By Ms. Kordziel): We had talked
- (25) about the Nordic 7542 as being the initial product,

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- (1) and then I believe Nordic Lite and Viking were the
- (2) next two products that were based on that.
- (3) A (Nodding head up and down.)
- (4) Q Are there any other products based on --
- (5) A I think the next one was Everest, if I recall
- (6) correctly.
- (7) Q What were the key features in the Everest
- (8) product?
- (9) A I honestly don't remember what the -- what the
- (10) particular differences were between, say, Viking and
- (11) Everest, except for the fact that Everest was a
- (12) higher performance part.
- (13) Q What was the time frame of the Everest
- (14) development?
- (15) A As best I can recall, it would have been in the
- (16) '95 time frame.
- (17) Q Was there another product in the Nordic product
- (18) family line after Everest?
- (19) A There was a product called Madderhorn.
- (20) Q These other names, Everest and Madderhorn, also
- (21) were product families; is that correct? There were
- (22) other versions of these products?
- (23) A I think of them as -- basically as single
- (24) products. There may have been versions, but I don't
- (25) recall there being multiple generations, so to speak.

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- (1) Q Okay. What were the key features of the
- (2) Madderhorn product?
- (3) A Again, I know higher performance, but I
- (4) can't - I can't tell you more specifically than
- (5) that.
- (6) Q What was the time frame of the Madderhorn
- (7) development?
- (8) A As best I can place it, I would say in the '96
- (9) time frame.
- (10) Q Were there any other products based on the
- (11) Nordic product after Madderhorn?
- (12) A There was a - another product called
- (13) Madderhorn 3-D, but in fact it - it was a
- (14) combination of certain pieces of Madderhorn plus
- (15) pieces of another desktop part. So it was really a
- (16) pretty significant departure, rather than sort of a
- (17) linear evolution.
- (18) Q I actually had one question about - just a
- (19) general question about Cirrus's time frames.
- (20) Fiscal year, is that - for example, if I
- (21) see fiscal year '96, is that referring to actually
- (22) calendar year '95?
- (23) A No, it's not quite that simple.
- (24) Q It was a little confusing to me in the
- (25) documents between calendar year, fiscal year and

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- (1) where the quarters are.
- (2) A We are currently in fiscal year '99, which will
- (3) end on March 31st, 1999. So fiscal year '99
- (4) starts - this isn't exactly correct because of the
- (5) accounting calendar, but to the closest calendar
- (6) date, calendar month, it would be April 1 of '98
- (7) through March 31st of - or March 30th, I'm not -
- (8) March 30th or -
- (9) MR. LEVIN: 31.
- (10) THE WITNESS: - 31 of '99.
- (11) Q (By Ms. Kordziel): So, for example,
- (12) what would be first quarter fiscal year of '99 then,
- (13) in terms of calendar years?
- (14) A It would have been the June quarter of this
- (15) year.
- (16) Q So from 4 - April 1st through -
- (17) A June 30.
- (18) Q - June 30?
- (19) A Now again, we have a fiscal calendar, so the
- (20) fiscal months and years don't necessarily end on the
- (21) end of a calendar month.
- (22) Q Can you explain that?
- (23) A Yes. It's pretty common to have an accounting
- (24) calendar -
- (25) Q Right.

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- (1) A - where you have months that are what we call
- (2) 4-4-5, so the first month of the fiscal quarter is
- (3) four weeks; the second month is four weeks; and the
- (4) third month is five weeks. So that makes a total of
- (5) 13 weeks.
- (6) Now calendar months vary in length.
- (7) Q That's right.
- (8) A And also you don't have an integral number.
- (9) You don't have 52 weeks exactly in a year. So you
- (10) will get some variations between the end of fiscal
- (11) months and years and calendar months and years.
- (12) The only thing I can say beyond that
- (13) would be to give you a copy of our fiscal calendar
- (14) and let you -
- (15) Q Thanks. It was just that when I was looking
- (16) through a lot of the documents, it talked about
- (17) fiscal years and calendar years and quarters. I was
- (18) trying to match them up. But it was a little
- (19) difficult sometimes getting the exact -
- (20) A Takes some practice.
- (21) Q After the Madderhorn 3-D, are there any other
- (22) products in the Nordic product family line?
- (23) A Well, first of all I would say that
- (24) Madderhorn - I would not consider Madderhorn 3-D to
- (25) be part of the Nordic product family.

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- (1) Q Going back to our discussion of Motion Video
- (2) Architecture, you had mentioned scaling.
- (3) A Uh-huh.
- (4) Q Is that both horizontal and vertical scaling?
- (5) A The answer is yes. The answer is yes.
- (6) Q What was the involvement of the Pixel
- (7) Semiconductor division in the development of the
- (8) Nordic 7542 product?
- (9) A My recollection is that the - first of all,
- (10) point of clarification. I'm trying to remember if it
- (11) was still Pixel at that time, because there was a
- (12) point in time in which it - Pixel was absorbed into
- (13) Cirrus Logic and no longer had a separate identity -
- (14) Q I see.
- (15) A - and became what we called the Plano design
- (16) center. So let me clarify that you are more
- (17) concerned about the people -
- (18) Q At Plano.
- (19) A - at Plano than you are about whether it was
- (20) part -
- (21) Q That's right. I'll refer to it I guess as the
- (22) Plano group or something to -
- (23) A My recollection is that the Plano group did not
- (24) have any direct involvement in the Nordic
- (25) development.

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- (1) Q So the engineers from Plano and the engineers
- (2) from the Fremont plant didn't work together on the
- (3) 7542 product?
- (4) A My recollection is that the Plano group had
- (5) their own projects, and that they were not part of
- (6) the Nordic development team.
- (7) Q What were the projects in Plano?
- (8) A If I recall correctly -- well, I would assume
- (9) that there was some work going on on the Pixel
- (10) product line. Whether it was new development or
- (11) sustaining engineering, I -- I don't know.
- (12) There was also a -- a development
- (13) project, I believe, that led to a desktop product
- (14) called the 5440.
- (15) Q What were some of the features of the 5440?
- (16) A The 5440 added video functionality to the pure
- (17) graphics controller.
- (18) Q The video functionality of the 5440 seems very
- (19) similar to the video functionality in the 7542. Is
- (20) that correct?
- (21) A My impression is that at a high level of
- (22) description, that's correct, but at a more detailed
- (23) level, and also at a design and implementation level,
- (24) that there were considerable differences, since they
- (25) were developed by different -- different teams, and

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- (1) in fact within different business organizations.
- (2) Q What were the different business organizations?
- (3) A There was a portable group which had business
- (4) and engineering responsibility for the notebook
- (5) graphics devices, core logic and PCMCIA host
- (6) adaptors, and there was a separate business group
- (7) that had responsibility for desktop products.
- (8) Q You just mentioned a few minutes ago with
- (9) respect to the 5440 and the 7542, in terms of detail
- (10) and design and implementation, the features are
- (11) different. Can you elaborate, first with respect to
- (12) the detail, what are some of the differences in the
- (13) features?
- (14) A I really couldn't -- couldn't tell you in
- (15) detail.
- (16) Q What about the design and implementation? What
- (17) are some of the differences between the 5440 and the
- (18) 7542?
- (19) A Again, I can't tell you in detail. What I can
- (20) tell you is that they were done by different
- (21) development teams led by different architects. And
- (22) they were not -- one was not simply a copy of the
- (23) other. They were done independently.
- (24) Q So they are on sort of like parallel
- (25) development tracks, I guess, one in Plano and one in

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- (1) Fremont?
- (2) A How do you mean, parallel?
- (3) Q I guess not parallel, separate --
- (4) A Yes, they were separate development activities.
- (5) Q Was the time frame of the 7542 development
- (6) earlier or later than the 5440 development?
- (7) A I don't know precisely when the 5440
- (8) development started, but my recollection is that the
- (9) 7542 was completed before the 5440.
- (10) Q What do you mean by "completed"?
- (11) A Basically available to -- to sell to customers.
- (12) Q So this would be after tape-out and sampling,
- (13) this is actual on the market?
- (14) A Right.
- (15) THE WITNESS: Could we take a break?
- (16) MS. KORDZIEL: Oh, sure. Why don't we
- (17) take five minutes. Let's go off the record.
- (18) (A recess was taken.)
- (19) MR. LEVIN: This is David Levin for
- (20) Cirrus Logic, incorporated.
- (21) I just wanted to mention that before the
- (22) deposition started this morning, I handed you, Linda,
- (23) a copy of documents that we produced yesterday. This
- (24) is just a courtesy copy, because I believe these are
- (25) from Mr. Dickinson's files. But these documents are

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- (1) Bates labeled CL 82117 through CL 82132, a total of
- (2) 15 or 16 pages, I think.
- (3) Also, I wanted to ask that today's
- (4) deposition be designated as confidential under the
- (5) protective order.
- (6) MS. KORDZIEL: That's fine.
- (7) MR. LEVIN: Finally, I wanted to point
- (8) out for the record my understanding that Mr.
- (9) Dickinson will have the standard period for reviewing
- (10) the transcript and signing it after he's completed an
- (11) errata sheet.
- (12) MS. KORDZIEL: That's fine.
- (13) MR. LEVIN: Thank you.
- (14) Q (By Ms. Kordziel): Mr. Dickinson, I
- (15) guess before the break we were talking about the
- (16) separate development tracks of the 5440 and the 7542,
- (17) and also we had talked about how the functionality on
- (18) the higher level is very similar.
- (19) With respect to the 5440, did it have the
- (20) Motion Video Architecture functionality that we
- (21) discussed earlier?
- (22) A First of all, I don't recall whether the Motion
- (23) Video Architecture label was used in conjunction with
- (24) marketing the 5440. It may have been or it may not
- (25) have been, but I don't have a clear recollection of

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- (1) that.
- (2) In terms of being able to capture, store,
- (3) process and display video, my recollection is that
- (4) the 5440 had those capabilities.
- (5) I'm using "processing" here again in the
- (6) sense of color space conversion and scaling.
- (7) Q It also had decompression capability?
- (8) A In terms of decompression, I don't have a clear
- (9) recollection that it did. It may have, but I don't
- (10) have - I cannot recall that it does.
- (11) Q The 5440 also stored video and graphics data in
- (12) a multiformat frame buffer, is that correct?
- (13) A I believe so, but I - I can't tell you that I
- (14) clearly remember that it did.
- (15) Q The 7542, the Nordic product, had it have color
- (16) keying capabilities?
- (17) A I'm not certain.
- (18) MS. KORDZIEL: I'd like to have this
- (19) marked as Exhibit Number 2.
- (20) (Marked for identification: Respondent's
- (21) Exhibit Number 2.)
- (22) Q (By Ms. Kordziel): It's a document
- (23) bearing Bates number 95294 through 95304.
- (24) MR. LEVIN: Preceded by the letters CL.
- (25) Q (By Ms. Kordziel): CL, yes. Mr.

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- (1) Dickinson, are you familiar with this document?
- (2) A I don't recall having seen it, and I don't see
- (3) my name on the distribution.
- (4) Q This European multimedia trip report, would
- (5) that have been - would you have been involved with
- (6) that at all?
- (7) A Probably not.
- (8) Q Was Alpine the family name for the 5440
- (9) product?
- (10) A I - I believe Alpine was the family name for
- (11) the desktop products. So if you're asking if the
- (12) 5440 was in the Alpine family?
- (13) Q That's right.
- (14) A Yes, that would be my belief.
- (15) Q If you could turn to page CL 95302?
- (16) A Okay.
- (17) Q Under the heading "general," I believe this is
- (18) a meeting with ICL, Helsinki, Finland.
- (19) A Uh-huh.
- (20) Q It talks about the Alpine multimedia features,
- (21) and states that "Mr. Kurikko was interested in all
- (22) the three main Alpine multimedia features: video
- (23) overlay, video input port and video playback
- (24) acceleration."
- (25) A I'm sorry, where -

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- (1) Q Under "graphics."
- (2) A Oh, yes, all right.
- (3) Q If you want some time to read this, please feel
- (4) free to go ahead.
- (5) A Okay, I've read that paragraph.
- (6) Q Is this referring to the Alpine multimedia
- (7) features with respect to the 5440?
- (8) MR. LEVIN: I'll have to object, lack of
- (9) foundation for that question, because he testified he
- (10) wasn't at this meeting.
- (11) MS. KORDZIEL: That's right, but we've
- (12) noticed the marketing of the 5440, so to the extent
- (13) that he's testifying on behalf of Citrus -
- (14) MR. LEVIN: Well, I have to take
- (15) objection with that statement, because although we
- (16) have designated him to testify on these topics, that
- (17) is not the same as saying that he is knowledgeable as
- (18) to every document that mentions any of these numbers.
- (19) MS. KORDZIEL: Well, you can state your
- (20) objection. If we don't get the testimony, we'll
- (21) continue it later. But I want to know what Mr.
- (22) Dickinson knows about this.
- (23) MR. LEVIN: Well, that would be a good
- (24) way to go about asking him, but with the proper
- (25) foundational questions, I think.

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- (1) Q (By Ms. Kordziel): Mr. Dickinson,
- (2) were you aware of this meeting?
- (3) A I - I don't believe so.
- (4) Q Looking at these three multimedia features,
- (5) would they have been multimedia features with respect
- (6) to the 5440 product?
- (7) MR. LEVIN: I'll have to object to that
- (8) question as ambiguous.
- (9) THE WITNESS: Could you restate the
- (10) question?
- (11) Q (By Ms. Kordziel): We had talked
- (12) about some of the multimedia features that are
- (13) present in the 5440. So based on this, the video
- (14) overlay, video input port, video playback
- (15) acceleration, would those be some of the multimedia
- (16) features that are present in the Alpine 5440 product?
- (17) A The video input port would be. I'm pretty
- (18) certain that video overlay would be. But I don't
- (19) know about video playback acceleration.
- (20) Q In the second paragraph under "graphics," the
- (21) last sentence says that "Mr. Kurikko was interested
- (22) in a graphics solution which could support one color
- (23) format for the graphics data (for example, 8 bits per
- (24) pixel) and another format for the video data (16 bits
- (25) per pixel)."

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- (1) Would that be the multiformat frame
- (2) buffer?
- (3) MR. LEVIN: Objection, ambiguous as to
- (4) "that."
- (5) THE WITNESS: I'm not sure what you mean
- (6) by "the multiformat frame buffer."
- (7) Q (By Ms. Kordziel): Would the
- (8) multiformat frame buffer, would that be a solution
- (9) for supporting one color format for the graphics data
- (10) and another format for the video data?
- (11) A The way that I would describe this would be he
- (12) was asking for a solution that -- that could handle
- (13) multiple formats.
- (14) The thing that's puzzling me is your use
- (15) of the word "the," as though there's only a single
- (16) way --
- (17) Q I see.
- (18) A -- to do that.
- (19) Q What would your understanding be then?
- (20) A My understanding of --
- (21) Q Of this sentence.
- (22) MR. LEVIN: Objection, lack of
- (23) foundation, calls for speculation.
- (24) THE WITNESS: But I should still answer?
- (25) MR. LEVIN: If you can.

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- (1) THE WITNESS: Just based on reading
- (2) what's here, in fact, as I read it again, it doesn't
- (3) even necessarily require a multiformat frame buffer.
- (4) It simply says he's looking for a graphics solution
- (5) which could be multiple devices, and even more than
- (6) one frame buffer that would -- within the totality of
- (7) that solution -- be able to deal both with 8-bit
- (8) graphics data and 16-bit video data.
- (9) Q (By Ms. Kordziel): Okay.
- (10) A So it's really quite -- quite a general
- (11) statement and not a very specific statement, in fact.
- (12) MS. KORDZIEL: We'll have this marked
- (13) Exhibit 3.
- (14) (Marked for identification: Respondent's
- (15) Exhibit Number 3.)
- (16) Q (By Ms. Kordziel): This exhibit
- (17) bears Bates Numbers CL 110877 through CL 110885.
- (18) Mr. Dickinson, are you familiar with
- (19) this document?
- (20) A Yes.
- (21) Q Is this from your file, the June '93 Japan
- (22) trip?
- (23) A I believe it is. I believe it is.
- (24) Q Turning to Bates number CL 110878, the date's
- (25) May 18, 1993 and the subject is portable multimedia

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- (1) roadmap meetings.
- (2) What was the purpose of the meetings,
- (3) the portable multimedia roadmap meetings with the
- (4) customers listed here, ICM, Toshiba, NEC, Sony,
- (5) Sharp, Matsuhita?
- (6) A The purpose was to gain the interest of these
- (7) potential customers in the direction that we were
- (8) considering taking with our portable graphics product
- (9) line.
- (10) We were actually behind in our product
- (11) development, and were looking for ways to rebuild our
- (12) momentum in that marketplace by showing some
- (13) leadership in our product direction. So this tour
- (14) was an attempt to start that process.
- (15) In fact, the other comment I'd like to
- (16) make is that the paragraph on the bottom of that page
- (17) captures, I think, specifically how we were -- what
- (18) we were trying to do on that trip pretty accurately.
- (19) Q What were some of the products that you
- (20) proposed to these customers?
- (21) A In this trip, we didn't propose any specific
- (22) products. We did show them what products we had
- (23) currently, and in fact I think probably some that
- (24) were planned, in our audio, video and graphics
- (25) product line.

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- (1) But we weren't proposing new products, we
- (2) were basically talking about what we thought were
- (3) some emerging standards in the video area that had
- (4) come out of work from VESA, Video Electronics
- (5) Standards Association.
- (6) Q What were some of the current products that you
- (7) had discussed with these customers?
- (8) A We would have discussed the Pixel products, our
- (9) audio CODECs, and our -- our portable graphics
- (10) devices, I would guess also our desktop graphics
- (11) devices.
- (12) I say the latter because from a graphics
- (13) standpoint, they were more advanced than our notebook
- (14) products were, specifically in terms of having
- (15) acceleration, which our notebooks products didn't at
- (16) that time.
- (17) Q Would you have discussed the Nordic, the 7542
- (18) product?
- (19) A I don't believe that at that time we had gotten
- (20) to the point of having defined, even at a high level,
- (21) Nordic.
- (22) Q Were there any hand-outs that were given to
- (23) the customers or slides or presentations made?
- (24) A There were presentations made. I don't recall
- (25) whether we gave copies to the customers or not.

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- (1) Q The presentations, were they overheads or --
- (2) A Yes, they were overheads.
- (3) MS. KORDZIEL: Counsel, can you look for
- (4) the overhead presentations that were given during
- (5) this trip referenced in this document? I don't
- (6) believe that we have those.
- (7) MR. LEVIN: Perhaps we would ask the
- (8) witness if you're aware of where the overheads might
- (9) be located from this trip.
- (10) THE WITNESS: The person that put the
- (11) presentation together was Bo Ericsson, and -- who has
- (12) not been with the company for a couple years. So if
- (13) I were trying to put my hands on them, I'd go look
- (14) for whether we have any files in storage from -- from
- (15) Bo.
- (16) MR. LEVIN: Do you have --
- (17) THE WITNESS: That was one of the things
- (18) that I looked for and I did not find that I had a
- (19) copy in my files.
- (20) Q (By Ms. Kordziel): Would Bo have
- (21) again a power point, something on the computer or
- (22) database, a power point presentation or something
- (23) that would be on electronic form?
- (24) A He would have at that time. I'm sure these
- (25) were power point slides.

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- (1) Q Okay.
- (2) A So there could potentially be some soft version
- (3) of this, but as I say, he's been gone for a couple
- (4) years, so I have absolutely no idea what may be
- (5) around and what isn't.
- (6) Q Turning to the page bearing Bates Numbers CL
- (7) 11082 --
- (8) A Uh-huh.
- (9) Q Is this your handwriting?
- (10) A Yes.
- (11) Q At the top it says "IBM meeting, June 15,
- (12) 1993."
- (13) A Yes.
- (14) Q If you look down on the bottom half, it
- (15) references "Nordic." Do you recall what that was
- (16) referring to?
- (17) A Well, it looks to me like a -- a note to follow
- (18) up with one of the IBM people regarding Nordic, so my
- (19) statement earlier that we hadn't come up with a term
- (20) obviously was not -- was not an accurate
- (21) recollection.
- (22) Q What does CDPD stand for?
- (23) A Cellular Digital Packet Data, so it's a
- (24) wireless data protocol.
- (25) Q So at that time was Nordic already in

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- (1) development as of 6-15-93?
- (2) A I do not believe so. I would interpret this to
- (3) mean that we may have come up with a label for a
- (4) conceptual product at that time.
- (5) Q You mentioned during these meetings talking
- (6) about some of the things from the VESA standards; is
- (7) that correct?
- (8) A VESA.
- (9) Q VESA?
- (10) A Yes.
- (11) Q What were some of the areas of the VESA
- (12) standards that you discussed with these customers?
- (13) A If I recall correctly, one was a video port
- (14) definition. There were two proposed standards, if I
- (15) recall correctly. One was for a video port, and the
- (16) other was for a media bus. Those were both I believe
- (17) at that time proposed VESA standards.
- (18) Q The media bus, would that be the VESA advanced
- (19) feature connector or the VESA media bus, the VMC or
- (20) the VMC channel?
- (21) A The port would have been the advanced feature
- (22) connector, and the bus -- I don't recall what the bus
- (23) was --
- (24) Q The VMC channel perhaps?
- (25) A It might have -- yeah, VESA media channel or

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- (1) something like that, that sounds -- that sounds
- (2) right.
- (3) Q Turning to the next page, Bates number CL
- (4) 110883 --
- (5) A Uh-huh.
- (6) Q -- are these your notes from your meeting with
- (7) Toshiba?
- (8) A I believe so.
- (9) Q This page is also dated June 15, 1993?
- (10) A Yes.
- (11) Q If you look down in the middle, it has
- (12) "Tanaka" --
- (13) A Tanaka-san.
- (14) Q -- "Tanaka-san would like budgetary pricing
- (15) from Nordic." What did you mean by that statement?
- (16) A Budgetary pricing refers to a -- basically
- (17) identifying a price range for a product that is being
- (18) discussed very early in its evolution, and it's used
- (19) for a customer to say, yes, this sounds like it's in
- (20) the general ballpark, or it's not in the general
- (21) ballpark.
- (22) Q How would you come up with these figures, if --
- (23) you had mentioned that Nordic hadn't been defined at
- (24) that time. How would you come up with the numbers
- (25) for the budgetary pricing?

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- (1) A Well, it's not very scientific, because you
- (2) have to understand that when you're at this early
- (3) stage, what you're -- or what we were doing was
- (4) looking for the collection of things that would be of
- (5) interest to a customer. And that would include, in a
- (6) general sense, what a product would do, what its
- (7) capabilities were, when it would have to be
- (8) available, and what the price range would be.
- (9) So budgetary pricing is actually mostly a
- (10) process of trying to guess what is an acceptable
- (11) price range for the customer. It would not be based
- (12) on a -- any sort of detailed estimate of the cost of
- (13) the product, certainly not at the stage that we're
- (14) talking about here.
- (15) Q Do you break out the pricing with respect to
- (16) different areas or is this just a lump sum figure
- (17) that you give to the customer?
- (18) A In a case like this -- and I don't recall
- (19) whether we provided that, and if so, when we did --
- (20) it would have been most likely a range, because
- (21) again, we didn't have the ability to -- to be more --
- (22) more precise than that.
- (23) Our intention was to engage the interest
- (24) of the customer and understand what their price
- (25) sensitivity was.

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- (1) Q Also on the previous page and this page, it
- (2) mentions "copy of presentation." That would be the
- (3) presentation that was presented to IBM and to
- (4) Toshiba; is that correct?
- (5) A Yes, I would interpret that to mean that they
- (6) had asked for a copy, and therefore that we hadn't
- (7) left one during the meeting.
- (8) MS. KORDZIEL: So if you could go back
- (9) and look to see whether or not you have a copy of
- (10) those presentations, and also whether or not a
- (11) budgetary pricing was given to Toshiba for Nordic,
- (12) that would be very helpful.
- (13) MR. LEVIN: Perhaps we could ask, have
- (14) you looked for these presentations already?
- (15) THE WITNESS: In fact, that was one of
- (16) the things that I was keeping my eyes open for when I
- (17) went through my file, including the archived files
- (18) that I had brought back.
- (19) MR. LEVIN: So you looked for this but
- (20) you weren't able to find it. Is that right?
- (21) THE WITNESS: That's correct.
- (22) Q (By Ms. Kordziel): Do you think --
- (23) do you know whether or not -- well, first, the other
- (24) people that are listed here, are any of these people
- (25) still with Cirrus?

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- (1) A Kimio Fuji is and Takeo Wada. None of the
- (2) others are.
- (3) MS. KORDZIEL: I guess, counsel, if you
- (4) could check with these people to see whether or not
- (5) they kept a copy of their presentation of pricing --
- (6) MR. LEVIN: Of course. One request that
- (7) I would like to make -- although we will endeavor to
- (8) satisfy all reasonable discovery requests, we take
- (9) our responsibility very seriously -- it would be
- (10) helpful to us later just to clarify the record if you
- (11) could follow up with a letter, we'll be sure to
- (12) address each of the --
- (13) MS. KORDZIEL: That's fine. I'll mention
- (14) as we go along, but it will most likely have to be
- (15) tomorrow. I'll send a letter to you.
- (16) MR. LEVIN: I don't mean to imply that
- (17) we'll wait for the letter. I'm just pointing out it
- (18) would be helpful to be sure that we've addressed all
- (19) the requests.
- (20) MS. KORDZIEL: I understand, that's fine.
- (21) Q (By Ms. Kordziel): The other
- (22) customers that are listed here, did you speak with
- (23) the other customers regarding the Nordic product?
- (24) MR. LEVIN: Objection, ambiguous as to
- (25) "other customers."

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- (1) Q (By Ms. Kordziel): The customers
- (2) listed on Bates number CL 110878.
- (3) A I think that if you look at 880, that would
- (4) be -- those would be the customers that we had -- had
- (5) meetings with, although frankly -- yeah, those would
- (6) be the -- those would be the customers that we had
- (7) the meetings with.
- (8) Q Do you know whether Cirrus discussed the
- (9) Nordic product with respect to the other customers
- (10) that are listed on this page 110880?
- (11) MR. LEVIN: Objection, misstates the
- (12) testimony as to "Nordic product."
- (13) THE WITNESS: I don't recall whether we
- (14) gave the full presentation to all the customers. And
- (15) the reason I say that is that in some cases, we
- (16) would -- with our most advanced concepts, we would
- (17) only discuss that with -- with a handful of potential
- (18) customers.
- (19) Q (By Ms. Kordziel): I noticed in some
- (20) of your other documents you refer to some customers
- (21) as alpha customers and some customers as beta
- (22) customers. What is the difference between alpha and
- (23) beta customers?
- (24) A Are you asking that with specific respect to --
- (25) Q To portables or the portable --

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- (1) A To the Nordic?
- (2) Q The Nordic.
- (3) A I think I -- rather than trying to answer that
- (4) in a general sense, it would be more constructive to
- (5) look at the specific documents that you are going
- (6) to -- and I can probably answer questions about the
- (7) usage of the term in the context of those documents.
- (8) Q Okay, that's fine. So between alpha and beta
- (9) there's not a distinction, a general distinction?
- (10) MR. LEVIN: Objection, misstates the
- (11) testimony.
- (12) THE WITNESS: There's a general
- (13) distinction between alpha and beta, but it's not what
- (14) I would call a -- the definitions aren't hard and
- (15) fast.
- (16) Q (By Ms. Kordziel): I see.
- (17) A And so I think that we have to look at the
- (18) context in which those were used to really understand
- (19) whether they were in fact different or being used at
- (20) different times for the same thing.
- (21) Q Okay, that's fine.
- (22) A Sitting here, I can't tell you the answer to
- (23) that, but I think that if we look at some of those
- (24) documents, I could probably clarify it for you.
- (25) Q That's fine. We'll get to those.

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- (1) What was the result of your trip to Japan
- (2) in June?
- (3) A My recollection is that we felt that there was
- (4) some interest on the part these people in the
- (5) direction that we were talking about going.
- (6) Again, this trip in a sense was a trial
- (7) balloon, because we were saying it may make sense to
- (8) put video capabilities together with graphics into
- (9) graphics controllers, and so we were testing that
- (10) idea to see whether we would get a favorable
- (11) reception or not.
- (12) My recollection is that we came back
- (13) thinking, yeah, there seems to be some interest in
- (14) this, we should continue down this path and try and
- (15) refine our ideas into a more concrete form.
- (16) Q With respect to the Nordic designation that's
- (17) used in the notes, do you recall what types of
- (18) features or broad general concepts were referenced
- (19) with respect to "Nordic"?
- (20) A Well, in fact, the most fundamental feature
- (21) that we were talking about was adding acceleration.
- (22) I think I mentioned earlier that at this
- (23) point in time, our products were not very
- (24) competitive. And the reason for that was that
- (25) Western Digital had introduced a notebook graphics

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- (1) device called the 90C24, which was developed while I
- (2) was there, by the way, that had graphics
- (3) acceleration.
- (4) The Cirrus Logic notebook products at
- (5) that time did not have acceleration, and as a result,
- (6) Western Digital was very successful in getting design
- (7) wins in this period of time for their new product,
- (8) and we were not getting design wins, Cirrus Logic was
- (9) not getting design wins.
- (10) So the most critical new feature in
- (11) Nordic was in fact the addition of acceleration. And
- (12) we were getting that capability from the 5428, which
- (13) I mentioned earlier, which was an accelerated desktop
- (14) graphics part.
- (15) Now in addition, because we were in a
- (16) follower position as opposed to Western Digital, and
- (17) not only we but our other competitors were also
- (18) adding acceleration, we were trying to see, well, is
- (19) there something else that we can put into the product
- (20) that would set us apart. That's where the video came
- (21) in.
- (22) So the thing that would have been very
- (23) clear to us at that point in time what would be in
- (24) our next generation notebook product -- and it
- (25) appears that we had already assigned a code name to

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- (1) that -- was graphics acceleration.
- (2) The thing that was not clear to us at
- (3) that point, but we were trying to get some initial
- (4) reaction to, was the idea of also incorporating some
- (5) video functionality.
- (6) Q Do you remember what some of that video
- (7) functionality encompassed?
- (8) A Well, at that point in time, we had this input
- (9) from VESA on these proposed standards. So I believe
- (10) that what we were talking about was the ability to
- (11) capture, display, and perhaps output video.
- (12) I would -- I don't recall that we had a
- (13) very specific definition of how -- what that would --
- (14) what that would encompass at that time, that it was
- (15) at kind of the high level that I've just described.
- (16) Q Who was responsible for creating these
- (17) high-level types of definitions of products?
- (18) A Well, at this point -- somewhere around this
- (19) point in time we had had a change in management of
- (20) the portable graphics business unit.
- (21) Q What was the change?
- (22) A A fellow named Prakash Agrawal was replaced by
- (23) a man named Del Mank, in terms of the general
- (24) management responsibility.
- (25) And so at this stage, I think it was

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- (1) probably Del and myself and Bo Ericsson who had
- (2) started talking about this conceptual opportunity of
- (3) adding video.
- (4) But this was at a point in time where
- (5) there were not a lot of video applications for
- (6) personal computers. So the whole question in our
- (7) mind was -- it was not clear whether this was
- (8) something that our customers would find value in or
- (9) not.
- (10) Q So as of June '93, those video functions, had
- (11) you determined whether or not some of the features we
- (12) had talked about earlier, for example, the shared
- (13) frame buffer with video graphics data, would that
- (14) have been one of the features discussed?
- (15) A I'm not certain. I suspect not, but I'm not
- (16) certain.
- (17) Q After the meetings, what was Cirrus's next plan
- (18) of action with respect to the Nordic product?
- (19) A My recollection is that we came back and said,
- (20) well, we need to try and get a more specific
- (21) definition of the product concept.
- (22) Q Who was in charge of trying to get a higher
- (23) definition of the Nordic product conception or
- (24) concept?
- (25) A Well, it was in Del Mank's organization, and at

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- (1) some point -- and I don't recall exactly when -- he
- (2) involved Vlad Bril, who was the engineering manager.
- (3) At some point in that time frame, the
- (4) marketing leadership went from a fellow named Mark
- (5) Singer to a fellow named Bob Conner. But I don't
- (6) recall exactly when that was. It may have been a
- (7) little bit later --
- (8) Q Well --
- (9) A -- since I -- I don't recall.
- (10) Q Do you know whether Del Mank or Mark Singer,
- (11) whether either one of them are still with Cirrus
- (12) today?
- (13) A No, neither of them are with Cirrus.
- (14) Q Would their files -- do you know whether or not
- (15) their files would be in archives?
- (16) A I don't know.
- (17) MS. KORDZIEL: Counsel, if you could
- (18) check with respect to Del Mank and Mark Singer,
- (19) whether or not they have any files in Cirrus's
- (20) archives regarding the presentations and the
- (21) definitions of "Nordic" --
- (22) MR. LEVIN: Okay. I don't believe the
- (23) files are organized by departing employee, but
- (24) certainly I'll look into that.
- (25) MS. KORDZIEL: Good. We'll have this

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- (1) marked as Exhibit 4. It's a document bearing Bates
- (2) Numbers CL 110917 through 110919.
- (3) (Marked for identification: Respondent's
- (4) Exhibit Number 4.)
- (5) Q (By Ms. Kordziel): Mr. Dickinson,
- (6) how often would Cirrus employees visit customers
- (7) regarding the Nordic product around this time frame
- (8) of June '93?
- (9) A I would say every few months. Basically we
- (10) were trying to keep them engaged, so as we were
- (11) honing in on the functional definition of the
- (12) product, we would -- when we would make a
- (13) significant -- some significant progress in that, we
- (14) would want to go back and keep the customers briefed
- (15) on where we were.
- (16) Q Can you identify this document?
- (17) A Yes, I think so.
- (18) Q So was there another Nordic tour, I guess, in
- (19) August of '93?
- (20) A Yes, late -- late August.
- (21) Q Did you attend this Nordic presentation tour
- (22) with Del Mank?
- (23) A I'm pretty certain that I would have attended
- (24) some of the meetings. Whether I attended them all, I
- (25) don't know. It's not clear from this.

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- (1) Q If you'd turn to Bates number 110918 --
- (2) A Yes.
- (3) Q -- under the heading "portable multimedia
- (4) follow-up, customer requirement feedback, technical
- (5) detail, take an engineer," what was that referring
- (6) to?
- (7) A Which part in particular?
- (8) Q I guess each one of those phrases.
- (9) MR. LEVIN: Would you like to take them
- (10) in order?
- (11) Q (By Ms. Kordziel): That's right. If
- (12) you'll start with the portable multimedia follow-up.
- (13) A Okay. What that means to me is that it was
- (14) the -- the next round of meetings, as I described,
- (15) with respect to our plans.
- (16) Q Technical detail, what was your understanding
- (17) of that?
- (18) A I don't know what specifically was meant by
- (19) that. The "take an engineer" to me indicates to me
- (20) that we would be taking one of our Japanese -- one of
- (21) the field application engineers from our Japanese
- (22) organization. And if you look down below you see
- (23) the name D-E-W-S, that's Joe Dews, and he was an FAE,
- (24) if I recall correctly, at that time.
- (25) And the customer requirement feedback,

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- (1) again the process that we were going through was that
- (2) we would -- starting at a very high conceptual
- (3) level -- say this is what we're thinking of, get some
- (4) feedback from the customer, then take that back and
- (5) say, okay, let's try and pin things down more
- (6) clearly, down to the next level.
- (7) And when we'd done that, we would go back
- (8) to the potential customers again and say, okay, this
- (9) is more detail, more specific, tell us whether you
- (10) think that's -- we're on track in terms of what
- (11) you're looking for or not.
- (12) So it was very much of an iterative
- (13) process, because as you go from high-level concepts
- (14) finally to a concrete design, there's a lot -- you
- (15) make a lot of decisions in that process. And you can
- (16) have something that at a conceptual level the
- (17) customer says, well, that's fantastic, and by the
- (18) time you get it down to its specific implementation,
- (19) they say, well, that's ridiculous, we don't want
- (20) that. So it's necessary to sort of take check points
- (21) along the way.
- (22) Q At the time of the Nordic presentation tour in
- (23) August of '93, at what level was the design and
- (24) implementation?
- (25) MR. LEVIN: Objection, ambiguous as to

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- (1) "level."
- (2) THE WITNESS: I'm not even certain
- (3) whether actual design had started at that point. My
- (4) recollection would be that we were still in the
- (5) process of nailing down specifications.
- (6) Q (By Ms. Kordziel): Also, you had
- (7) mentioned earlier "design win." What does that term
- (8) mean with respect to Cirrus?
- (9) A Design win means that a customer has selected a
- (10) part to be used in one of their designs, which would
- (11) be for a computer in this case, portable computer.
- (12) Q Turning to the last page, Cirrus 110919 --
- (13) A Yes.
- (14) Q -- who was Mr. Dang?
- (15) A Dang.
- (16) Q Dang.
- (17) A Lam Dang was a -- I don't recall if he was
- (18) still in engineering or had moved into sort of a -- a
- (19) customer management role in our mass storage
- (20) business, so he was totally unconnected with
- (21) graphics.
- (22) Q I see.
- (23) A That was why I was saying I wasn't sure if I'd
- (24) been to all the Nordic meetings, because I may have
- (25) attended some of the meetings with Mr. Dang also.

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- (1) Q Do you remember whether or not presentations
- (2) were made to these customers, for example, overhead
- (3) slides or power point presentations?
- (4) A I don't recall specifically. Our normal
- (5) practice was to -- to make overhead presentations.
- (6) Q Have you checked your files to see whether or
- (7) not presentations from the August -- if you had any
- (8) presentations from the August tour?
- (9) A Yes.
- (10) Q And you don't?
- (11) A And I don't.
- (12) Q I'll have this marked -- oh, actually, what
- (13) was the result of the Nordic presentation tour in
- (14) August '93?
- (15) MR. LEVIN: Objection, ambiguous as to
- (16) "result."
- (17) THE WITNESS: I don't have a specific
- (18) recollection of the outcome of the August tour.
- (19) Generally speaking, we felt that the feedback in the
- (20) second half of '93 was positive, but in terms of what
- (21) it was specifically from this trip, I don't -- I
- (22) couldn't tell you.
- (23) MS. KORDZIEL: I'd like to have this
- (24) marked Exhibit Number 5. It's a document bearing
- (25) Bates number C L2 26389 through 26507.

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- (1) (Marked for identification: Respondent's
- (2) Exhibit Number 5.)
- (3) Q (By Ms. Kordziel): Are you familiar
- (4) with this document?
- (5) A I don't -- I don't know whether I've seen it
- (6) before or not. I may have, but just looking at the
- (7) cover, I don't know.
- (8) Q What is the user interface group at Cirrus?
- (9) A User interface was a term that we used in that
- (10) period for essentially the graphics business,
- (11) although it had some other elements as well.
- (12) Q If you'd turn to Bates Numbers 26407 --
- (13) A Okay.
- (14) Q I believe that's where the portable products
- (15) division operations review starts.
- (16) A Yes.
- (17) Q Have you seen this portion of the portable
- (18) products division operations review document at all?
- (19) A Again I can't tell whether I've seen this
- (20) particular one or not. These were held monthly. And
- (21) I certainly have seen a lot of these. But whether
- (22) I've seen this particular one --
- (23) Q I see. So you would attend these operations
- (24) reviews?
- (25) A I would attend these when I was in the U.S.,

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- (1) and sometimes I was not in the U.S. when they took
- (2) place.
- (3) Q They were monthly?
- (4) A That's my recollection.
- (5) Q Who at Cirrus would attend these operations
- (6) reviews?
- (7) A The senior people in this user interface group,
- (8) and when I say senior people, business management and
- (9) marketing more so than engineering. And then some
- (10) members of the corporate staff, and the CEO would
- (11) often attend.
- (12) Q Have you checked your files for these
- (13) operations reviews?
- (14) A Yes. I did not make a practice of -- of
- (15) retaining this type of operation.
- (16) MS. KORDZIEL: Counsel, if you could just
- (17) check with some of the other people, the business
- (18) management, marketing, and the corporate CEO, we end
- (19) with September 21st, 1993. We don't have one for
- (20) August, November or January.
- (21) MR. LEVIN: You're speaking of the user
- (22) interface --
- (23) MS. KORDZIEL: User interface and also
- (24) the portable products division operations review.
- (25) MR. LEVIN: They appear to end in August

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- (1) or September of '93?
- (2) MS. KORDZIEL: September of '93. We have
- (3) some for the Pixel operation review that continue
- (4) through, but as far as the portable products
- (5) division, September '93 is the last one we have.
- (6) We're missing November, December, January, those in
- (7) particular.
- (8) MR. LEVIN: Okay. I will certainly look
- (9) into that.
- (10) Q (By Ms. Kordziel): If you turn to
- (11) page 26442 --
- (12) A 442?
- (13) Q That's correct.
- (14) A Okay.
- (15) Q At the top it says "Portable Graphics
- (16) Engineering, August 11, 1993 Highlights." If you
- (17) look down, there's one for the Nordic 1M?
- (18) A Yes.
- (19) Q What was the Nordic 1M?
- (20) A That was probably the first -- the first -- the
- (21) first designation was probably "Nordic," then "Nordic
- (22) 1M" would have been a designation for what was
- (23) ultimately the 7542, I believe.
- (24) Q Does the "1M" stand for anything? 1 meg, or is
- (25) there any particular --

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- (1) A It may well stand for 1 meg in terms of frame
- (2) buffer size or something like that, but I don't have
- (3) a clear recollection.
- (4) Q On this page it says that the "Nordic 1M on
- (5) track: PCI bus, panel logic and top level design
- (6) phase is completed, simulation is in progress." What
- (7) is your understanding of that statement?
- (8) A That would imply that -- just what it states,
- (9) I presume, that a high-level design had been
- (10) completed as opposed to a detail design.
- (11) Q What does "simulation" referring to?
- (12) A Simulation would be -- well, since I'm not
- (13) certain what they mean by "top level design" in this
- (14) context, I don't know what level of simulation that
- (15) would be. But it would be a -- basically a
- (16) verification of the -- whatever design had been
- (17) completed.
- (18) Q Like a computer simulation of the design?
- (19) A Right, at the level that we're talking about.
- (20) As I say, I don't know what they meant by "top
- (21) level."
- (22) Q If you'd turn to page 26448 --
- (23) A Yes.
- (24) Q What's a marketing plan? If you look at the
- (25) second bullet point under "marketing must do's."

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- (1) A Right. I see the point. I don't know
- (2) specifically what this refers to.
- (3) Q Also "Initial Discussion on Preliminary Specs,
- (4) Data Book Started," do you know what that bullet
- (5) point is referring to?
- (6) A Well, it's not clear to me whether they're
- (7) talking about discussion on what the specs should be
- (8) or discussion on documenting the specs. So those
- (9) would be the two interpretations I would imagine
- (10) might be appropriate.
- (11) Q So marketing was also involved in documenting
- (12) the specifications?
- (13) A Yes, the functional specifications. In fact,
- (14) marketing would have had responsibility probably for
- (15) the technical publications aspect of the development.
- (16) Q What was the technical development of the
- (17) Nordic product as of this time frame, August 1993, if
- (18) they're already discussing the preliminary specs and
- (19) data book?
- (20) MR. LEVIN: Objection, calls for
- (21) speculation, and objection, lack of foundation.
- (22) THE WITNESS: I would think that the page
- (23) that we were looking at a moment ago would be the
- (24) best indication of the technical development. But
- (25) with respect to specs, I mean the functional specs

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- (1) have to drive the technical development. So that
 (2) would typically be leading the technical development.
 (3) Q (By Ms. Kordziel): I see. Then
 (4) there's another bullet point, "Demo boards," and it
 (5) says at the very last sentence, "Multimedia version
 (6) to demonstrate full features - essentially an LCD
 (7) version of Media Manager board." Do you know what
 (8) the Media Manager board is?
 (9) A Yes. The Media Manager board was a combination
 (10) of several devices, graphics, I think - yeah, there
 (11) was some video capability - functionality on it -
 (12) that was used for CDROM playback, and including both
 (13) video and audio.
 (14) It was accomplished through using
 (15) multiple discrete devices like audio CODECs and video
 (16) processing chips and graphics chips to accomplish at
 (17) the board level a multimedia capability.
 (18) So what this is referring to is doing the
 (19) version - and it was designed for use with a CRT
 (20) display. So this is referring to doing a version of
 (21) that board which would drive an LCD display, and the
 (22) purpose being to simulate what an advanced device
 (23) like Nordic could do.
 (24) Q Nordic is a chip, is on a chip level, and this
 (25) is the board level version?

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- (1) A Right.
 (2) Q I see.
 (3) A Using multiple chips.
 (4) Q Do you know what chips were used on the Media
 (5) Manager board?
 (6) A I don't remember.
 (7) Q Do you know what some of the functionality of
 (8) the Media Manager board was, for example, did it have
 (9) the storing of the video data with graphics data in
 (10) the frame buffer?
 (11) A I think that's unlikely because it was using
 (12) separate graphics and video and audio devices.
 (13) What was most likely is that it was an
 (14) overlay, separate frame buffers with the video
 (15) overlay.
 (16) Q What group at Cirrus worked on the development
 (17) of the Media Manager board?
 (18) A It was within this user interface group, and I
 (19) think it was the software group that actually took
 (20) the lead in putting that together.
 (21) Q Turn to the next page, 26449.
 (22) A Uh-huh.
 (23) Q Under the engineering bullet point, it says
 (24) "Nordic development on track, T/O." I assume
 (25) "tape-out" - "still okay by January 31st, 1993,"

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- (1) which I'm assuming that's 1994?
 (2) A I would assume so, since this is dated August
 (3) '93.
 (4) Q What is tape-out?
 (5) A Tape-out can be used a couple of different
 (6) ways. Most likely, since this is the engineering
 (7) development group, they meant providing - let me
 (8) just be sure here. It would probably be the
 (9) information - well, let me tell you what the
 (10) possibilities are -
 (11) Q Sure.
 (12) A - because as I look at this context, I can't
 (13) be a hundred percent certain.
 (14) One possibility would be the release of a
 (15) net list to the place and route group.
 (16) Q What is net list?
 (17) A It basically tells how the transistors are
 (18) connected to each other, or even the - not the
 (19) transistors but the cells, the standard cells, inputs
 (20) and outputs are interconnected. Or it could be the
 (21) database that results from the place and route, which
 (22) is now ready to go to the mask, mask making.
 (23) I honestly don't know which stage they
 (24) were talking about here.
 (25) Q The Cinepak acceleration, that's referring to

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- (1) the compression of the Cinepak compression that we
 (2) had discussed briefly earlier, is that correct?
 (3) A Decompression.
 (4) Q Decompression, I'm sorry.
 (5) A Yes, I would think so.
 (6) Q Up top it says that the top level design phase
 (7) completed. Would there have been design documents as
 (8) of this time, August '93?
 (9) A What exactly do you mean by -
 (10) Q Engineers would have been working on the design
 (11) and generating internal design documents?
 (12) MR. LEVIN: Is that a question? I'm
 (13) sorry, I don't understand the question.
 (14) Q (By Ms. Kordziel): I guess, would
 (15) there have been?
 (16) MR. LEVIN: Could I ask you to restate
 (17) the question?
 (18) Q (By Ms. Kordziel): Sure. As of this
 (19) time, August '93, would there have been design
 (20) specifications circulated among the engineers?
 (21) MR. LEVIN: I'll object, calls for
 (22) speculation.
 (23) THE WITNESS: I mean it's reasonable to
 (24) assume that there were some level of design
 (25) specifications and design database that was - that

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- (1) resulted from this activity. I don't know from
- (2) firsthand knowledge what methodology, detail
- (3) methodology the engineers were using, and what there
- (4) was. But there would have been something.
- (5) Q (By Ms. Kordziel): Do you know
- (6) whether or not Vlad Bril would have started working
- (7) on the Nordic as of this time, August '93?
- (8) A Based on what's being presented here, I would
- (9) assume that Vlad had begun working on it, yes.
- (10) MS. KORDZIEL: Counsel, can you also
- (11) check for Vlad Bril's engineering documents or
- (12) documents from engineers who worked on the portable
- (13) group? We have some technical specifications, but
- (14) they're later. We have very little from the fall of
- (15) '93. Any of these high-level design documents or
- (16) other functionality documents.
- (17) MR. LEVIN: Certainly I'll take that
- (18) under advisement.
- (19) Q (By Ms. Kordziel): This portable
- (20) graphics overview and user interface was dated I
- (21) believe August 17, 1993. The earlier document,
- (22) turning to Exhibit Number 4 --
- (23) A Yes.
- (24) Q The Nordic tour was at the end of August, '93.
- (25) A Correct.

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- (1) Q So I think earlier, I believe you weren't sure
- (2) in terms of the design. So I guess could we say that
- (3) as far as the end of August '93, the design had gone
- (4) as far as what's stated in Exhibit Number 5, the top
- (5) level design phase has been completed?
- (6) MR. LEVIN: Are you referring to a
- (7) particular page?
- (8) MS. KORDZIEL: I believe when we talked
- (9) about Exhibit Number 4, Mr. Dickinson testified he
- (10) wasn't sure what level the design had proceeded with
- (11) respect to engineering. I just wanted to point out
- (12) that this document was before the Nordic presentation
- (13) tour.
- (14) MR. LEVIN: Right. But when you say
- (15) "this document," just for the record, what document
- (16) are you referring to?
- (17) MS. KORDZIEL: Exhibit Number 5.
- (18) MR. LEVIN: Are you referring to a
- (19) particular page?
- (20) MS. KORDZIEL: Bates CL 26449.
- (21) THE WITNESS: Yes, I would assume that
- (22) this is an accurate representation of the state of
- (23) the development at that time.
- (24) MS. KORDZIEL: We'll have this marked as
- (25) Exhibit Number 6.

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- (1) (Marked for identification: Respondent's
- (2) Exhibit Number 6.)
- (3) Q (By Ms. Kordziel): Mr. Dickinson,
- (4) are you familiar with this document bearing Bates
- (5) Numbers CL 26759 through CL 26878?
- (6) A I'd make the same comment that I'm familiar
- (7) with the generic set of documents, and again I don't
- (8) know whether I have seen this particular one or was
- (9) present at the meeting.
- (10) Q This document is a user interface, September
- (11) 21st, 1993, operations review document?
- (12) A Yes.
- (13) Q I'd like to turn back to the portable section
- (14) of the operations review. It starts at Bates number
- (15) CL 26777.
- (16) A Okay.
- (17) Q In particular I'd like to go to Bates number
- (18) 26825.
- (19) A Okay.
- (20) Q Let's start with the first bullet point,
- (21) "Encouraging response from Japan customers and
- (22) Compaq." Would that be referring to the Nordic tour
- (23) presentation that was taken in the end of August '93?
- (24) A That would be -- that would be logical, yes. I
- (25) mean I didn't write this, so --

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- (1) Q No, I understand. I just want to know what
- (2) your understanding was.
- (3) A But that would be my assumption.
- (4) Q What does it mean when it says "Most
- (5) graphics-related specifications are now closed"?
- (6) A Graphics-related specifications would mean to
- (7) me things like the acceleration features, the
- (8) resolutions, the frame rates, the graphics --
- (9) graphics modes, the panels that would be supported,
- (10) and that sort of thing.
- (11) Q The next bullet point, "Proof of technology is
- (12) needed before Multimedia (Video) specifications can
- (13) be closed." What does "proof of technology" refer
- (14) to?
- (15) A Well, in fact, I think this is a pretty good
- (16) indication of where things were at that point in
- (17) time, because we had been talking about, as I
- (18) mentioned earlier, concepts with respect to video.
- (19) The customers were basically saying, well, that
- (20) sounds interesting, but can you demonstrate to us
- (21) that it's really feasible to do the sorts of things
- (22) that you're talking about.
- (23) I don't know specifically what -- which
- (24) aspects they were asking about, but it's pretty clear
- (25) that they had some questions about whether certain

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- (1) capabilities that we were saying we wanted to put
- (2) into this product actually could be made to work or
- (3) not.
- (4) Q Proof of technology -- because in the earlier
- (5) document it had mentioned simulation. Is proof of
- (6) technology different from computer simulation?
- (7) A Yes. Computer simulation in that earlier
- (8) context had to do with verifying that the intent of a
- (9) design of a section of logic had in fact been
- (10) accomplished by the design.
- (11) What's being referred to here is whether
- (12) a capability is technically feasible or not. So
- (13) they're entirely different -- entirely different
- (14) things.
- (15) Q Would that require building it and seeing if it
- (16) works, or is it more of a -- could it still be a
- (17) computer simulation of it?
- (18) A In some cases, a computer simulation might be
- (19) acceptable. But I would think that what was being
- (20) referred to here was actually a demonstration vehicle
- (21) of some sort that would take the particular
- (22) capability that we were talking about and saying,
- (23) here's a breadboard or a demonstration vehicle, a
- (24) feasibility demonstration vehicle that shows that
- (25) this can in fact be accomplished.

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- (1) Q I see. A breadboard would be a physical
- (2) implementation, I guess, of the design?
- (3) A Or not necessarily -- well, when you say "the
- (4) design" --
- (5) Q Of whatever the -- proof of technology, I
- (6) guess, is needed?
- (7) MR. LEVIN: I'll have to object as
- (8) ambiguous to that question. Could you be more
- (9) specific?
- (10) MS. KORDZIEL: I guess I was trying to
- (11) find out what proof of technology entails, and we
- (12) were discussing different ways, and Mr. Dickinson had
- (13) mentioned breadboard.
- (14) THE WITNESS: Let me give you an analogy
- (15) from a different area.
- (16) Let's suppose that we have a concept for
- (17) a particular type of radio. And -- like a transistor
- (18) radio. And the customer says, well, we don't think
- (19) that can be done. So one thing you could do is take
- (20) a bunch of off-the-shelf components, and sort of tie
- (21) them together in an ad hoc fashion, and say, this
- (22) receives a radio signal and plays music, so it shows
- (23) that that can be accomplished, even though an actual
- (24) product would be a very different design and
- (25) implementation. But it would demonstrate the

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- (1) principle that you can take a radio wave and turn it
- (2) into music.
- (3) So that's the spirit in which I would
- (4) interpret this "proof of technology," as a
- (5) demonstration of the validity of the principle.
- (6) Q (By Mr. Kordziel): I see. So it
- (7) says "Proof of technology is needed before Multimedia
- (8) (Video) specifications can be closed," and then the
- (9) first bullet point under that is "Expectation is
- (10) October, November, to close multimedia features." So
- (11) what would your understanding be of that first bullet
- (12) point? Would October, November be the time frame of
- (13) closing those multimedia video features?
- (14) MR. LEVIN: Objection, calls for
- (15) speculation, lack of foundation.
- (16) THE WITNESS: What -- what this says to
- (17) me is that this process, interactive process that we
- (18) were going through with the customers, as of
- (19) September, was still at a point where we could not --
- (20) we did not believe that we had agreement with our
- (21) major target customers on what video features should
- (22) be included in the Nordic product.
- (23) It says to me that there was some
- (24) skepticism on the part of the customers about what we
- (25) had proposed conceptually, and they were asking us to

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- (1) show that some things were possible, and that we were
- (2) hoping or planning -- even planning to be able to get
- (3) through that process by October or November.
- (4) Q (By Ms. Kordziel): At the bottom, it
- (5) refers to again a January tape-out schedule. Then it
- (6) says "Must be able to sample customers in March."
- (7) Does that help you determine which definition of
- (8) tape-out -- whether or not it's the netless or the
- (9) database?
- (10) A Or end of January tape-out to -- well, the
- (11) place and route would typically be probably several
- (12) weeks in duration. So it really doesn't. We were
- (13) talking about between tape-out and samples here. The
- (14) month of -- well, February -- well, maybe it does
- (15) make it more likely that it's the database. But
- (16) again, I can't say that with a hundred percent
- (17) certainty. But that's probably more likely, given
- (18) that timing.
- (19) Q Let's turn to the next page. It says
- (20) "Preliminary specification/data sheet for Alpha
- (21) customers targeted for end of October.. Develop an
- (22) Alpha site support program to assist in key customer
- (23) wins."
- (24) Does that help you in -- we had talked
- (25) about what alpha customers meant. Does that help

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- (1) refresh your recollection?
- (2) A Yes. In this context, alpha means the -
- (3) essentially the top priority customers.
- (4) Q Who were the top priority customers?
- (5) A Going from memory - and I think we provided a
- (6) document that lists them - in Japan, they would have
- (7) been IBM, Toshiba and NEC. And there were two or
- (8) three U.S. customers that would have been fallen into
- (9) that category.
- (10) Q Do you remember who the U.S. customers would
- (11) be?
- (12) A I believe they were Compaq, TI and Apple.
- (13) Q Why were these customers top priority?
- (14) A IBM, Toshiba, NEC and Compaq, if I recall
- (15) correctly, were the highest volume notebook
- (16) manufacturers at that time. TI was a customer that
- (17) we had had a close relationship with for some time.
- (18) So I think we wanted to make sure that they got early
- (19) exposure to our new products. And why Apple was on
- (20) that, I haven't the faintest idea at this point in
- (21) time.
- (22) Q So what would a beta customer be then?
- (23) A Well, again, I'll say the same thing. We
- (24) should look at that in context, and I can tell you
- (25) what the meaning is there.

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- (1) Q Sure.
- (2) THE WITNESS: Excuse me. I want to get a
- (3) little more water, if I may.
- (4) MS. KORDZIEL: Of course. Let's go off
- (5) the record.
- (6) (A discussion was held off the record.)
- (7) Q (By Ms. Kordziel): Let's go back on
- (8) the record.
- (9) What's a preliminary specification data
- (10) sheet?
- (11) A That would be a document that lists the
- (12) features that at that particular point in time we
- (13) were planning to incorporate in the product.
- (14) Q What were some of the features that you were
- (15) planning on incorporating into the product at that
- (16) time, I guess the fall of '93?
- (17) A Well, there would be a whole set of graphics
- (18) features, which again would be the modes, the
- (19) resolutions, the frame rates, the color depths, the
- (20) graphics processing capability such as BrBLT, the
- (21) panel support.
- (22) There would be power management
- (23) features. There would be the various types of video
- (24) features that we've been speaking about.
- (25) Q The video features that were the -

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- (1) A MVA.
- (2) Q The MVA?
- (3) A Right. And you know, at one point we were
- (4) talking about putting some audio capability in the
- (5) part, which as I recall was ultimately left out of
- (6) the part.
- (7) So what that illustrates is that the
- (8) specifications capture an intent at a point in time.
- (9) And in fact, they tended to change and features
- (10) tended to drop off as time went by, because of
- (11) difficulty of - of implementing them, or the cost in
- (12) silicon.
- (13) Q This next bullet point, "Develop an Alpha site
- (14) support program to assist in customer wins." What is
- (15) your understanding of that bullet point?
- (16) A I think that would be collateral material to
- (17) provide to this set of customers. It would be
- (18) technical support in terms of who would be supporting
- (19) the customers; probably evaluation boards; perhaps -
- (20) software would have to come in here someplace,
- (21) because we've been talking about the silicon, but of
- (22) course the complete product requires the software as
- (23) well.
- (24) Q Are there any other collateral materials?
- (25) A Well, I mean there's various types of

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- (1) documentation, and over time you would go from a spec
- (2) to a data sheet to a data book. There might be
- (3) application notes. The totality of those types of
- (4) things would be what I would believe they were
- (5) referring to in this bullet.
- (6) Q Let's turn to the next page, Bates Number
- (7) 26827.
- (8) A 26827?
- (9) Q Right.
- (10) A Okay.
- (11) Q Do you know what the half frame buffer design
- (12) was with respect to the Nordic 7542 product?
- (13) A There are a couple of things that I think
- (14) require the half frame buffer. One is that there's a
- (15) form of LCD panel called DSTN, dual STN, where
- (16) there's an upper half and a lower half that you're
- (17) sending data to at the same time. I believe that
- (18) that requires some additional frame buffering. And I
- (19) believe that that may be what the half frame buffer
- (20) is addressing.
- (21) The other thing is that there's a
- (22) simultaneous display capability where you're
- (23) displaying on a panel and an external device like a
- (24) CRT at the same time, and they have different frame
- (25) rates. So I think the half frame buffer may also

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- (1) help with dealing with the -- the different frame
- (2) rate requirements of the two displays.
- (3) Q What is the simultaneous display capability of
- (4) LCD and CRT, what is that exactly?
- (5) A Well, that means if you have a notebook, you
- (6) can have something being displayed on the built-in
- (7) LCD screen, and you can also have a cable from the
- (8) back of the unit to a CRT monitor and be displaying
- (9) the same image.
- (10) Now the problem is that those displays
- (11) have different resolutions and different frame rates,
- (12) so you have to do some buffering in order to be able
- (13) to be delivering two different data streams
- (14) representing the same image to two different
- (15) displays.
- (16) Q So the 7542 product would have been capable of
- (17) displaying on a CRT and also displaying on the LCD?
- (18) A Correct. Basically that was a requirement at
- (19) that point in time for any notebook graphics device.
- (20) Had nothing to do with video, per se.
- (21) Q If you'd turn to the next page, 26828. The
- (22) first bullet point, "Complete and freeze Nordic-1M
- (23) definition." What does it mean at Cirrus when it
- (24) says freeze the definition?
- (25) A This would be the functional specifications,

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- (1) and it looks to me like the engineering point of view
- (2) of what was pointed out in the marketing ckd a page
- (3) or two earlier, that the -- the requirements were not
- (4) frozen, they were still evolving.
- (5) Q What happens once the functional definition is
- (6) frozen?
- (7) A The definition has to be frozen before you can
- (8) complete the design. In other words, as long as the
- (9) requirements are changing, the design can't be
- (10) finalized.
- (11) Q Near the lower portion of this page, it says
- (12) "Complete live video breadboard by October 30,
- (13) 1993." Do you know what that bullet point refers to?
- (14) A I don't. It may refer to the technology, proof
- (15) of technology that was referred to earlier. But I
- (16) don't know that with any certainty.
- (17) Q Could that mean a breadboard with the video
- (18) functionality on it?
- (19) A I'm not sure what you mean by the video
- (20) functionality.
- (21) Q A breadboard that I guess shows the video
- (22) functionality that the engineers are trying to
- (23) develop with respect to the Nordic product.
- (24) MR. LEVIN: I object, ambiguous question,
- (25) perhaps unintelligible.

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- (1) Q (By Ms. Kordziel): Would this be
- (2) referring to the proof of technology?
- (3) MR. LEVIN: When you say "this," what are
- (4) you referring to?
- (5) Q (By Ms. Kordziel): The "live video
- (6) breadboard."
- (7) A It's really not clear to me what this is
- (8) referring to. I mean I could speculate, but it would
- (9) be -- it would be speculation.
- (10) Q Okay. Who would know about these engineering
- (11) details? Would Mr. Brill be knowledgeable?
- (12) A Well, he certainly would have been at that
- (13) time.
- (14) Q Who else, aside from Mr. Brill, was working on
- (15) the Nordic project at Cirrus?
- (16) MR. LEVIN: Are you referring to a
- (17) particular time frame?
- (18) Q (By Ms. Kordziel): Around this time
- (19) frame, fall of '93. You mentioned Brill was the head
- (20) engineer. Who was working with Mr. Brill?
- (21) A Well, I think earlier I mentioned a Russian
- (22) engineer named Sasha and Robert Han. Those are the
- (23) only -- I assume you're talking about engineering
- (24) people?
- (25) Q That's right.

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- (1) A Those are the only engineers whose names I
- (2) specifically recall.
- (3) Q Are they still with Cirrus?
- (4) A No.
- (5) MS. KORDZIEL: Counsel, can you also
- (6) check to see whether or not you can find their files?
- (7) MR. LEVIN: "They" being --
- (8) MS. KORDZIEL: Sasha and Robin Han, I
- (9) believe. Okay. I guess we can take a break for
- (10) lunch. Let's go off the record.
- (11) (The luncheon recess was taken.)
- (12) AFTERNOON SESSION 1:30 P.M.
- (13) MS. KORDZIEL: Let's go back on the
- (14) record.
- (15) Good afternoon. I'd like to have this
- (16) marked as Exhibit Number 7. It's a document Bates
- (17) numbered CL 27359 through 27366. I'm sorry, 27367.
- (18) (Marked for Identification: Respondent's
- (19) Exhibit Number 7.)
- (20) Q (By Ms. Kordziel): Can you identify
- (21) this document?
- (22) A Yes, uh-huh.
- (23) Q What is it?
- (24) A It's some input that my organization provided
- (25) to the user interface people for a sales review.

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- (1) Q What's Cirrus Logic KK?
- (2) A "KK" stands for "Kabushiki Kaisha," which is
- (3) the equivalent of "Incorporated."
- (4) Q I see.
- (5) A It's our Japanese subsidiary.
- (6) Q They were reporting to you at that time?
- (7) A Right. In fact, yes, they were reporting to me
- (8) at that time.
- (9) Q If you turn to page CL 27361?
- (10) A Uh-huh.
- (11) Q At the very bottom of the page it says, "Nordic
- (12) presentation tour was successfully done. NEC, IBM,
- (13) Toshiba, Fujitsu have a lot of interest in Nordic
- (14) architecture."
- (15) Do you know what that statement was
- (16) referring to?
- (17) A That was -- would have been the -- the August
- (18) meetings that we were talking about earlier, and
- (19) basically saying that these customers gave us a
- (20) positive reaction to -- to the concepts that we
- (21) presented:
- (22) Q If you turn to the page CL 27364 --
- (23) A Right.
- (24) Q It is a slide regarding the "hottest account
- (25) status, NEC."

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- (1) A Uh-huh.
- (2) Q If you see under "new opportunity," it says
- (3) "Alpine for PC98 Desktop."
- (4) A Yes.
- (5) Q What was that referring to?
- (6) A Let's see. In that time frame, we had gotten
- (7) our first 5428 design win, and it was good to go into
- (8) production. So it's not -- it's not clear to me
- (9) whether this represented an opportunity to get 5428
- (10) design wins in more of their systems, or whether it
- (11) represented an opportunity for our next generation
- (12) desktop, which was 5430. So it could have been
- (13) either one. I can't tell from this.
- (14) Q All right.
- (15) A I would -- well, I can't tell.
- (16) Q In the last bullet, "Nordic for the
- (17) PC98 Note" --
- (18) A Yes.
- (19) Q What is your understanding of that?
- (20) A That would simply be that PC98 Note was the NEC
- (21) domestic notebook family, and that we felt we had an
- (22) opportunity to get a design win for Nordic in that
- (23) family. So I mean it's basically saying, here's
- (24) something that we can go after.
- (25) MS. KORDZIEL: I'd like to have this

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- (1) document marked Exhibit 8.
- (2) (Marked for Identification: Respondent's
- (3) Exhibit Number 8.)
- (4) Q (By Ms. Kordziel): It's bearing
- (5) Bates number CL 110840.
- (6) MR. LEVIN: Just for the record, this is
- (7) a little difficult to read.
- (8) MS. KORDZIEL: Yes. Unfortunately the
- (9) original is --
- (10) MR. LEVIN: Original that you have?
- (11) MS. KORDZIEL: Yes, well, the one that
- (12) was produced to us was in this condition.
- (13) Q (By Ms. Kordziel): Can you identify
- (14) this document?
- (15) A Yes, I think so.
- (16) Q What is it?
- (17) A It was -- it appears to be the schedule of
- (18) visits for the next round of interaction with the key
- (19) prospects in Japan.
- (20) Q So this is the Nordic presentation or promotion
- (21) tour. Did you participate in this round of
- (22) meetings?
- (23) A I believe I did. You know, just looking at
- (24) this, I'm not a hundred percent certain, but I think
- (25) probably so.

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- (1) Q Do you remember what was discussed with respect
- (2) to the Nordic promotion tour in November of '93?
- (3) A I don't have a specific recollection sitting
- (4) here as to precisely what was presented. I mean
- (5) generally speaking, it would have been the latest
- (6) information that we had. But I don't, five years
- (7) later, have a clear recollection of what happened in
- (8) November.
- (9) Q Could you also go back and check your files to
- (10) see if you have anything relating -- other
- (11) correspondence with respect to the Nordic promotion
- (12) tour in the November '93 time frame?
- (13) A Well, actually this document, I think, is the
- (14) result of my checking my files for that.
- (15) Q I see.
- (16) A I kept -- I made essentially monthly visits to
- (17) Japan, and I kept a file of documents associated with
- (18) each of those visits. And I believe that's where
- (19) this came from.
- (20) Q But you don't have the actual presentation
- (21) materials?
- (22) A No. Generally I did not keep other people's
- (23) presentation material because its shelf life was very
- (24) limited. So I just knew that I'd just wait for the
- (25) next one. When I wanted to use it again, there would

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- (1) be a new version.
- (2) MR. LEVIN: Just to point out, I'm afraid
- (3) that's the problem we're running into with a number
- (4) of these documents. If a lot of people follow that
- (5) practice, it obviously makes it very difficult for us
- (6) at this point.
- (7) MS. KORDZIEL: I understand. If you can
- (8) just check the people who are referenced on these
- (9) documents, their files, that would be very helpful.
- (10) MR. LEVIN: I'll note that, and I will --
- (11) I'll do my best.
- (12) THE WITNESS: But specifically, I've been
- (13) through my files and I -- if I had come across any of
- (14) the presentation material, I would have provided it
- (15) to our attorneys.
- (16) Q (By Ms. Kordziel): I see. When did
- (17) you go through your files?
- (18) A With respect to the Nordic family, I think it
- (19) was within roughly the last month.
- (20) Q These people who are referenced up at the top,
- (21) who is still with Cirrus, if any?
- (22) A Only Kimio Fuji and myself.
- (23) MS. KORDZIEL: Counsel, if you can just
- (24) check with Mr. Fuji, and then also check with the
- (25) files of the other people, if they've left anything

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- (1) behind, that would be helpful.
- (2) MR. LEVIN: If we can locate them,
- (3) certainly.
- (4) Can I ask, do you know where Mr. Fuji's
- (5) office is now, which location?
- (6) THE WITNESS: Tokyo.
- (7) MR. LEVIN: He's in Japan?
- (8) THE WITNESS: Yes.
- (9) Q (By Ms. Kordziel): So the Nordic
- (10) promotion tour in November '93 would have just been
- (11) the same as the other monthly presentations that have
- (12) occurred, talking with the customers regarding the
- (13) Nordic architecture?
- (14) A Yeah, and again, as I've explained earlier,
- (15) each time we'd be getting more -- more specific. So
- (16) we would be moving from the general to the specific.
- (17) And -- but what I can't tell you based on my actual
- (18) memory is precisely where we were in November.
- (19) Q I see.
- (20) A Actually I think we've produced some documents
- (21) that shed some light on that, but you're asking me
- (22) what I remember, so --
- (23) Q And the purpose was to get design wins from the
- (24) customers?
- (25) A Yes, ultimately. But at the -- at the stage

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- (1) that we were in in November, we were not trying to
- (2) get design wins at that point, because it was too
- (3) early. We were trying to build momentum with the
- (4) customers. But given where we were, it was too early
- (5) to try and actually achieve a design.
- (6) Q But that was the goal, I guess?
- (7) A That was the ultimate goal, yes.
- (8) MS. KORDZIEL: Let's have this marked
- (9) Exhibit Number 9.
- (10) (Marked for Identification: Respondent's
- (11) Exhibit Number 9.)
- (12) Q (By Ms. Kordziel): This is a
- (13) document bearing Bates numbers CL 17835 through
- (14) 17836.
- (15) A Uh-huh.
- (16) Q Can you identify this document?
- (17) A Yes, I think so.
- (18) Q Would this be a presentation that you would
- (19) have presented to one of the customers?
- (20) A Yes. I believe this is a customer
- (21) presentation.
- (22) Q Then I note on a couple of the pages, for
- (23) example, CL 17827 --
- (24) A 827.
- (25) Q -- and 17834, it's very faint, but do you

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- (1) see -- it seems like it says "IBM, internal use
- (2) only"?
- (3) A Oh, yes.
- (4) Q What was the purpose of that?
- (5) A The purpose of that was to make it clear, in
- (6) this case to -- actually I can see the -- oh, yes,
- (7) okay, IBM, internal use only -- to make it very clear
- (8) to IBM that this was only for their internal use, we
- (9) didn't want them providing it to third parties. And
- (10) also to insure that if somehow it did get into
- (11) someone else's hands, that we would be able to
- (12) identify the source.
- (13) Q I see. Did you have different presentations
- (14) then for each customer?
- (15) A Right, right.
- (16) Q Each would be marked with their customer name?
- (17) A Right. And again, we would only do this for a
- (18) limited set of customers.
- (19) Q The alpha customers that we had discussed
- (20) earlier?
- (21) A Right.
- (22) Q I'm sorry, you said you would only do this for
- (23) a limited number of customers. The stamping of the
- (24) "IBM Internal" or giving the documents to --
- (25) A Giving the documents.

- (1) Q All right.
- (2) A Making the presentation. In other words, we
- (3) considered this to be proprietary information. So
- (4) this was not ready for general dissemination.
- (5) Q Looking at the first page, 17825, it says
- (6) "December, 1993."
- (7) A Uh-huh.
- (8) Q So would this have been a presentation made in
- (9) December?
- (10) A Well, that's when it would have been prepared.
- (11) I mean it might be given at any time after that until
- (12) it was replaced. So I mean -- typically life is such
- (13) that presentations were finished just before they had
- (14) to be presented. But I don't recall whether there
- (15) were any presentations in December or not.
- (16) I mean certainly in Japan, December is
- (17) not a -- a pretty slow month, particularly the last
- (18) part of it.
- (19) Q But typically you would date it right before
- (20) the presentation so you wouldn't have something that
- (21) was a presentation dated November '94 and then
- (22) presented in January, for example?
- (23) A I'm saying that's -- that was -- I would have
- (24) to say that was the typical situation, but I can't
- (25) tell you that this was the case with this particular

- (1) presentation. Being dated December seems odd to me,
- (2) quite frankly, because that's not a month when we'd
- (3) have a high level of activity in terms of customer
- (4) meetings in general.
- (5) Q Let's turn to the next page, 17826.
- (6) A Uh-huh.
- (7) Q Up at the first -- the first page, it says
- (8) "GD5428 core performance features." Then it lists
- (9) the BitBLT, the hardware cursor, color expansion,
- (10) linear addressing and CPU write buffer. So were
- (11) those the features that were carried over from the
- (12) 5428 product?
- (13) MR. LEVIN: Objection, carried over to --
- (14) Q (By Ms. Kordziel): To the Nordic
- (15) product features.
- (16) A Yes, that sounds -- that sounds right.
- (17) Q Looking further down the page, what does that
- (18) "1 megabyte or 2 megabyte scalable memory" mean?
- (19) A Well, 1 megabyte or 2 megabytes would be the
- (20) frame buffer size, and I'm not sure I know what
- (21) "scalable" refers to. I can't determine it from
- (22) what's on the page here.
- (23) Q If you turn to page 17829, up at the top it
- (24) says "Multimedia Overview."
- (25) A Uh-huh.

- (1) Q It refers to "Motion Video Architecture for
- (2) Playback."
- (3) A Uh-huh.
- (4) Q Is that the Motion Video Architecture that we
- (5) had discussed earlier today?
- (6) A I believe so.
- (7) Q Those features were the multiformat frame
- (8) buffer, the scaling, color space conversion and stuff
- (9) we had identified earlier; is that correct?
- (10) A Yes, I believe so, although here I notice that
- (11) the input, video input, is separately identified
- (12) under the live video bullet. So I think those two
- (13) together are probably what I was calling the video
- (14) functionality earlier.
- (15) Q We had talked about the X and Y scaling. Can
- (16) you describe that more in detail? Is it by
- (17) replication or by interpolation?
- (18) A My recollection is that on Nordic, I think X
- (19) was by interpolation and Y was by replication.
- (20) Q What is the --
- (21) A I'm not a hundred percent confident, but that's
- (22) my -- my best recollection.
- (23) Q What is the difference between interpolation
- (24) and replication?
- (25) A Interpolation allows sort of a continuous range

- (1) of the scaling factor, whereas replication, basically
- (2) you can only do it in integral multiples of the line
- (3) spacing, the scan line spacing.
- (4) Q With respect to the Nordic product, did the
- (5) multiformat frame buffer have on-screen and
- (6) off-screen areas?
- (7) MR. LEVIN: Objection, ambiguous as to
- (8) the time period you're referring to.
- (9) Q (By Ms. Kordziel): December of '93.
- (10) A I honestly don't know what the -- the memory
- (11) map in the frame buffer was in terms of on-screen and
- (12) off-screen.
- (13) Q Also did Nordic in this time frame, December
- (14) '93, did it have color keying capabilities?
- (15) A I don't know. But I'd like to clarify that of
- (16) course Nordic did not exist in that time frame, so
- (17) what we're talking about is the definition of
- (18) specification of the Nordic features, I suspect, I
- (19) assume.
- (20) Q Uh-huh.
- (21) A Is that correct?
- (22) Q Right.
- (23) A But in terms of color keying, I don't know.
- (24) Again I could speculate, but that's what I would be
- (25) doing.

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- (1) Q With respect to the Nordic architecture, did it
- (2) use window positioning to control where the graphics
- (3) or video data was output to the display monitor?
- (4) MR. LEVIN: Objection, ambiguous as to
- (5) the time period being referred to. Could you clarify
- (6) what --
- (7) MS. KORDZIEL: In December '93.
- (8) THE WITNESS: I'm sorry, would you repeat
- (9) that?
- (10) Q (By Ms. Kordziel): In December of
- (11) '93, with respect to the Nordic functional
- (12) architecture and specification, did it use window
- (13) positioning to control where the graphics data or
- (14) video data output would be to the display monitor?
- (15) A I believe that in all of our graphics products,
- (16) which would include Nordic, that the video was dealt
- (17) with as a window. I am not certain about the
- (18) graphics. I would assume the graphics was basically
- (19) background with the video being a window.
- (20) Q If you'd turn to the next page, 17830 --
- (21) A Let me just add one more thing.
- (22) Q Sure.
- (23) A What I've just described I'm pretty sure is the
- (24) normal mode of operation. That may not be the only
- (25) possible modes of operation. So you just might want

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- (1) to make a note of that.
- (2) Q What other possible modes of operation could
- (3) there be?
- (4) A Well, conceptually you could have video as the
- (5) background and graphics as a window. I mean there's
- (6) nothing that would prevent you from doing that. But
- (7) I don't believe that that would be the -- the most
- (8) useful way to do things. But I can't sit here and
- (9) say that that wasn't a capability that didn't exist.
- (10) So I just wanted to add that proviso.
- (11) Q If you turn to the next page, CL 17830, it
- (12) describes a video playback window.
- (13) A Yes.
- (14) Q What was your understanding of the video
- (15) playback in the Nordic architecture?
- (16) MR. LEVIN: Objection, ambiguous as to
- (17) time period again. Are you referring to as of
- (18) December 1993?
- (19) MS. KORDZIEL: That's right.
- (20) THE WITNESS: In what sense? What was my
- (21) understanding in what sense of the --
- (22) Q (By Ms. Kordziel): Well, I think it
- (23) distinguishes between the current -- it talks about
- (24) the Nordic MVA and the --
- (25) A I see.

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- (1) Q -- the features of the Nordic MVA.
- (2) A You mean the contrast that's --
- (3) Q That's right.
- (4) A -- described here? Yeah, my understanding was
- (5) that Nordic would allow the video to have a different
- (6) color depth than the -- than the graphics.
- (7) Q What's the advantage of having that feature,
- (8) the color depth feature?
- (9) MR. LEVIN: Objection, advantage over
- (10) what? It's ambiguous.
- (11) Q (By Ms. Kordziel): Well, this
- (12) contrast between the Nordic MVA and then the
- (13) previous -- the current GUI environment.
- (14) A The problem with what is being called the
- (15) current environment was that if you wanted to have
- (16) a -- a large color depth on the video, you'd also
- (17) have to do that on the graphics background.
- (18) Now windows at that time was used
- (19) primarily, normally with 8 bits per pixel or 256k
- (20) tolerances. So if you wanted to display 16-bit
- (21) video, and you had to run 16 bits on the graphics as
- (22) well, that would require more frame buffer memory.
- (23) And it would also cost you performance to process
- (24) those additional pixels or bits of color depth on the
- (25) graphics pixels. So it would be a memory and a

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- (1) performance disadvantage to have to use the same
- (2) color depths.
- (3) Oh, and I guess it's also pointing out
- (4) that it allows multiple video formats.
- (5) Q I'm sorry, where are you?
- (6) A The second sub-bullet under the second bullet,
- (7) it says "will support multiple types of data for
- (8) playback enhancement."
- (9) Q What portion of the Nordic MVA architecture
- (10) enabled Nordic to work with different color depths?
- (11) A That would be the multiframed frame buffer
- (12) primarily.
- (13) Q If you turn to the next page, CL 17831, if you
- (14) look on the bottom, it talks about a video overlay
- (15) port.
- (16) A Uh-huh.
- (17) Q What does it mean on the first bullet when it
- (18) says it "utilizes Cirrus Logic Media Manager add-in
- (19) board as reference for design, software, and driver
- (20) solutions?"
- (21) A The way that I would interpret that is that
- (22) with the -- the video overlay port, you would still
- (23) have to have some other circuitry that would provide
- (24) the video signal, take the raw video signal and
- (25) provide it in the form that could go into this port.

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- (1) The Medium -- part of the Medium Manager
- (2) design did the same thing.
- (3) Q So this bullet point, does it mean that it uses
- (4) the Medium Manager design?
- (5) A Part of it.
- (6) Q I see.
- (7) A So in other words, the video front end that was
- (8) ahead of the -- the graphics controller, the Nordic
- (9) graphics controller, apparently was similar to the
- (10) video front end on the Medium Manager board.
- (11) Q So some of the features of the Medium Manager
- (12) board were carried over to the Nordic design
- (13) architecture?
- (14) A Well, it was more that the -- part of the
- (15) environment that the Medium Manager board represented
- (16) was -- could be used in conjunction with the Nordic,
- (17) is the way I think I would put it.
- (18) Q Okay.
- (19) A So some of the circuit board design, some of
- (20) the software could be used in conjunction with
- (21) Nordic.
- (22) Q The Nordic architecture was capable of
- (23) processing playback video and live video; is that
- (24) correct?
- (25) MR. LEVIN: Objection, ambiguous as to

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- (1) time period.
- (2) Q (By Ms. Kordziel): The same time
- (3) period, December '93.
- (4) A Yes. And the distinction was that the
- (5) playback -- the source of the playback video would be
- (6) I think typically coming over the system bus from a
- (7) CDROM or from a disk, whereas live video might be
- (8) coming in on a cable from, say, a --
- (9) Q A camera?
- (10) A Right, exactly.
- (11) Q Turning to the top of page 17834, this refers
- (12) again to the alpha customer sites. Those would be
- (13) the customers you had identified earlier, IBM,
- (14) Toshiba?
- (15) A I believe so.
- (16) Q If you turn to the next page, 17835, it refers
- (17) to the Nordic hardware plan. It states it's "on
- (18) course for end of January, early February tape-out."
- (19) A Right.
- (20) Q Tape-out would be the database?
- (21) A Yeah. It would be the same meaning as what we
- (22) were talking about before, which I'm presuming would
- (23) be the database.
- (24) I'm just chuckling to myself a little bit
- (25) because we're now seeing the schedule slip starting

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- (1) to creep in.
- (2) Q What is included in the database?
- (3) A In the sense that I was using "database," it's
- (4) basically geometric information that's used for
- (5) producing the masks to actually process the wafers.
- (6) Q Does Cirrus produce the masks in-house or do
- (7) they send that to an outside company?
- (8) A I believe that we subcontract the mask making.
- (9) Q Then it says "Work on Motion Video module
- (10) progressing, scheduled for completion early
- (11) January." What does that mean?
- (12) A I would interpret that as the design work at a
- (13) module level. The total design would have been made
- (14) up of many modules, and this would be the module that
- (15) dealt with the video specifically, because you'll see
- (16) immediately behind that there's a module integration
- (17) activity that was scheduled to take place in
- (18) January. So the video module would be a piece of the
- (19) design that was related to the video functionality.
- (20) Q All right.
- (21) A So this tells me that in December this design
- (22) work was underway.
- (23) Q I guess was scheduled for completion early
- (24) January was the --
- (25) A At that time, yes.

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- (1) Q Turning back to the first page -- well, turning
- (2) back to page 17832, the bottom diagram, does that
- (3) depict obtaining the live video from a camera and
- (4) also it's connected to the PCI local bus, so that's
- (5) where the playback data would be received?
- (6) MR. LEVIN: Objection. The question is
- (7) ambiguous and unintelligible, I think. Or is that a
- (8) question?
- (9) Q (By Ms. Kordziel): That's correct.
- (10) I was just wondering whether this depicts what we
- (11) were discussing regarding the live video and the
- (12) playback video.
- (13) A Well, I was -- this looks to me like it depicts
- (14) the path for the live video overlay. It doesn't look
- (15) to me like it's intended to show the data path for
- (16) the playback.
- (17) MS. KORDZIEL: The next document we'll
- (18) have marked as Exhibit Number 10.
- (19) (Marked for identification: Respondent's
- (20) Exhibit Number 10.)
- (21) Q (By Ms. Kordziel): Can you identify
- (22) this document?
- (23) A Yes, I believe so.
- (24) Q Is this document from one of your files?
- (25) A I believe it is.

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- (1) Q Turning to the first page bearing Bates numbers
- (2) CL 110834 -
- (3) A Yes.
- (4) Q - I noticed on the fax header it said page 12
- (5) of 12, but there were only four pages together.
- (6) A If I recall correctly, what I did was - from
- (7) the larger presentation - select the pieces that
- (8) were relevant to Nordic.
- (9) Q Do you have the rest of the presentation?
- (10) A I may well.
- (11) Q If you can just look through the files and see
- (12) if you can find the rest of the presentation, we'd
- (13) like just to see the whole package, the whole
- (14) document.
- (15) A Sure. So this is the -
- (16) MR. LEVIN: The rest of the presentation,
- (17) even though it doesn't pertain to Nordic? I just
- (18) want to be clear on what you're asking.
- (19) MS. KORDZIEL: Well, we'd like to review
- (20) the rest of the presentation.
- (21) Q (By Ms. Kordziel): This was for a
- (22) Japan operation review? Was the date of the review
- (23) on December 6, 1993?
- (24) A Yes, that's what it looks like.
- (25) Q How often did you have operational reviews for

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- (1) the Japan business?
- (2) A Quarterly.
- (3) Q Looking in the middle of the page, it says
- (4) "Nordic for IBM, NEC and Toshiba."
- (5) A Yes.
- (6) Q What was your understanding of that bullet
- (7) point?
- (8) A Well, if you look at the heading for this, it's
- (9) "Business Focus in Q4, '94," which would be the
- (10) January, February and March '94 quarter. So this is
- (11) our fiscal year.
- (12) Q I'm sorry, could you repeat that?
- (13) A Right. It says "Business Focus for Q4, '94."
- (14) This would be fiscal '94, the fourth quarter of our
- (15) fiscal '94. And that would be the January '94
- (16) through March '94 quarter.
- (17) In other words, this review was in
- (18) December of '93, and this is what we were proposing
- (19) to focus on in the following quarter.
- (20) Q Okay.
- (21) A January, February and March of 1994.
- (22) Q So the fiscal quarter four of '94 refers to in
- (23) calendar years January '94 through March '94?
- (24) A Correct. Right. And these were business
- (25) opportunities that we wanted to pursue during that

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- (1) time period.
- (2) Q Turning to the next page, it states that the
- (3) Nordic presentation tour was successfully done, NEC,
- (4) IBM, Toshiba, Fujitsu have a lot of interest in
- (5) Nordic architecture.
- (6) Do you remember which Nordic presentation
- (7) that would be?
- (8) A Well, given the date of the presentation, I
- (9) would assume that it was referring to the meetings
- (10) that took place in November, although there's a
- (11) little bit of ambiguity here because it says Q2 major
- (12) accomplishments, and Q2 would actually have been
- (13) July, August, September. But I'm not sure why we
- (14) would have been reporting on that in December. So I
- (15) don't know whether the Q2 is an error and should say
- (16) Q3, or whether it was just old information -
- (17) Q I see.
- (18) A - going back to the August meetings. It's not
- (19) clear to me from this.
- (20) Q Turning to the next page, at the bottom it
- (21) says, "Our target is Nordic for high-end multimedia
- (22) PC and PCMCIA-H/A for new Thinkpac PC?"
- (23) A Yes.
- (24) Q What is your understanding of that statement?
- (25) A This was with respect to IBM, and they were

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- (1) working on a high-end multimedia notebook. And we
- (2) were saying that we would like to try and get them to
- (3) select Nordic for that - for that computer.
- (4) Q What is the PCMCIA?
- (5) A It's an interface - I can't remember offhand.
- (6) what the acronym stands for. H slash A stands for
- (7) host adaptor. It's basically an interface that
- (8) allows you to take something, a module the size of a
- (9) business card, and plug it into a slot in a notebook
- (10) computer.
- (11) We were selling what are called host
- (12) adaptor chips that support that interface, and so we
- (13) were hoping to get some design wins for those chips
- (14) in some of the new notebooks from IBM.
- (15) Q We talked about earlier that I guess Nordic had
- (16) the capability of either sending display for a CRT or
- (17) an LCD. Why was it not marketed for the desktop
- (18) business?
- (19) A Because it was a more costly solution and a
- (20) lower performance solution than the desktop chips.
- (21) Q Why was it more costly?
- (22) A Because we had to add power management
- (23) capability and we had to add support for LCD panel
- (24) displays.
- (25) Q You mentioned less performance?

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- (1) A Yes.
- (2) Q Why was there less performance?
- (3) A I think the -- the basic answer is that because
- (4) you had to add additional capabilities beyond what
- (5) was required for the desktop requirement, that it
- (6) took longer, and therefore you were working with an
- (7) earlier graphics core. So there's nothing -- nothing
- (8) in the laws of physics that said you couldn't have a
- (9) portable part that was as powerful as a desktop part
- (10) at the same time, but normally that didn't happen.
- (11) Normally the portable part lagged, and therefore at a
- (12) given point in time the portable performance was
- (13) lower.
- (14) Q So there was no -- I guess with respect to the
- (15) engineers who were working on the Nordic, there was
- (16) no thought of using the MVA that we had talked about
- (17) with respect to a desktop?
- (18) A No, I can say pretty categorically that there
- (19) wasn't, because their charter was strictly to work on
- (20) the portable market. And there was an entirely
- (21) separate organization whose charter was to work on
- (22) the desktop market. So either one would have
- (23) considered the other to be encroaching if they had
- (24) started moving out of their own market, so to speak.
- (25) Q Turn to the next page, which discusses the

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- (1) NEC --
- (2) A Yes.
- (3) Q In the middle it says "We are promoting Nordic
- (4) for the PC98 Note."
- (5) A Yes.
- (6) Q What was the PC98 Note?
- (7) A That's their -- the NEC family of notebooks for
- (8) the Japanese domestic market. And you'll notice the
- (9) first part of that bullet is that "NEC is now
- (10) investigating Windows acceleration for PC98 Note."
- (11) So if you'll recall, earlier I talked
- (12) about the transition that Western Digital had led
- (13) from nonaccelerated notebook graphics to accelerated
- (14) notebook graphics. This says that NEC is deciding
- (15) when they're going to make that transition.
- (16) Q So at this point, Cirrus was promoting the
- (17) Nordic, which would have the graphics acceleration
- (18) with the additional video features?
- (19) A Right. And NEC was still -- wasn't even
- (20) getting to the video yet apparently. They were still
- (21) thinking about the graphics acceleration.
- (22) Excuse me. I'd like to get a little more
- (23) coffee, if I may.
- (24) MS. KORDZIEL: We can go off the record.
- (25) (A discussion was held off the record.)

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- (1) MS. KORDZIEL: We'll have this marked as
- (2) Exhibit Number 11.
- (3) (Marked for identification: Respondent's
- (4) Exhibit Number 11.)
- (5) Q (By Ms. Kordziel): Can you identify
- (6) this document?
- (7) A Yes, I can.
- (8) Q What is it?
- (9) A It's a summary of the plan for engaging
- (10) customers on Nordic.
- (11) Q Let's start with the first page, Bates numbers
- (12) 110787.
- (13) A Right.
- (14) Q My first question is, it says "Beta-Site
- (15) Customer." Earlier we had talked about with respect
- (16) to these customers as being alpha customers. Was
- (17) there a difference here?
- (18) A That's why I was hesitant to try and give you a
- (19) generalized definition of alpha and beta, because my
- (20) recollection is that at some times we talked about
- (21) this group of customers as alpha customers, and some
- (22) times as beta. So I don't believe that with respect
- (23) to Nordic there was any distinction between those two
- (24) terms.
- (25) Q Okay.

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- (1) A If there was, it was a minor one that escapes
- (2) me in retrospect.
- (3) Q Because I had seen "alpha" referred to a lot
- (4) and then I saw "beta." I just didn't know, was there
- (5) some distinction --
- (6) A Right, right. So I believe that for all
- (7) intents and purposes it's the same group of
- (8) customers.
- (9) Q So you have beta site customers and then a
- (10) column with major customers and a column with key
- (11) customers and then a column with R.O.W. customers.
- (12) Can you describe, I guess, or tell me what the
- (13) differences are between the four sets of customers?
- (14) A I'll try.
- (15) Q Okay.
- (16) A This document was put together as a result of
- (17) negotiation of a number of sales organizations. And
- (18) to a sales organization, every customer of theirs is
- (19) an important customer. So trying to decide who are
- (20) the most important customers is a very ticklish thing
- (21) to accomplish.
- (22) That's why when you look at beta site
- (23) customer, major customer and key customer and R.O.W.,
- (24) which stands for rest-of-world customer, the intent
- (25) was to provide a hierarchy upon which we would base

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- (1) the timing and the level of effort that we were going
- (2) to put into pursuing those customers.
- (3) However, "beta site" versus "major"
- (4) versus "key" is to -- the two terms were chosen so as
- (5) not to slight anybody's customers, basically. And I
- (6) guess R.O.W. were the ones that we didn't feel that
- (7) we had to be as cautious about from that standpoint.
- (8) But in essence, it's simply a hierarchy
- (9) of priorities. You can see that reflected in the
- (10) timing with which we were going to engage them in a
- (11) whole set of dimensions starting with just early
- (12) presentations to when production would be available
- (13) or at least samples, and the level of support, the
- (14) nature of the support.
- (15) Q The estimated volume, what did that refer to?
- (16) A The unit volume, monthly unit volume of their
- (17) computers that would be targets for our part.
- (18) Q For the Nordic product?
- (19) A Right.
- (20) Q If we look down at the bottom under "key
- (21) dates," for the beta site customers --
- (22) A Uh-huh.
- (23) Q -- the initial presentation was for September
- (24) '93?
- (25) A Yes.

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- (1) Q Then underneath it says "monthly update." Does
- (2) that mean that they had monthly updates after that
- (3) initial presentation?
- (4) A Well, that meant that that was the plan. I
- (5) don't believe that that was actually the case, but
- (6) that was the intention. I mean I don't believe that
- (7) we actually literally gave them monthly updates.
- (8) Q Okay.
- (9) A But that was the intention of the plan.
- (10) Q Do you know what the date of this document is?
- (11) A Do I know what the --
- (12) Q The date.
- (13) MR. LEVIN: Objection, when you say "this
- (14) document" --
- (15) MS. KORDZIEL: Or this page, 110787.
- (16) MR. LEVIN: Okay.
- (17) MS. KORDZIEL: It didn't seem like the
- (18) second page -- it was Bates numbered sequentially,
- (19) but it seems like -- we'll get into that, but it
- (20) seems like there's some missing pages.
- (21) Q (By Ms. Kordziel): But as far as the
- (22) page bearing 110787, can you tell what the date of
- (23) that --
- (24) A I can't -- I can't tell from this.
- (25) Q Under "initial presentation," it says "data

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- (1) sheet." It has a date of February '94, under that it
- (2) has a prerelease revision of 11-93.
- (3) A Yes.
- (4) Q What is the data sheet?
- (5) A The data sheet, as I know it, would be a
- (6) relatively few pages that would have a -- basically
- (7) list the features of the product. And it might
- (8) include a pin-out and register definitions, or it
- (9) might not.
- (10) A final data sheet I would think would --
- (11) would have the pin-out and the register definitions.
- (12) Q But it would describe, for example, the MVA
- (13) features and the graphics acceleration features of
- (14) the product?
- (15) A From a features standpoint. It wouldn't really
- (16) tell you how they were designed.
- (17) In other words, the data sheet describes
- (18) a part from looking at it from the outside. Its
- (19) intention really is not to tell you much about what's
- (20) inside the part, just what it does and how you would
- (21) use it.
- (22) Q What is a sample date?
- (23) A That would be the date at which we would
- (24) provide a piece of silicon and software that would be
- (25) sufficient for the customer to start evaluating the

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- (1) part and the software.
- (2) Q If you turn to the next page bearing Bates
- (3) number 110788, at the very top of the page there's
- (4) "3.4, Milestones and Schedules." Then it says a
- (5) "Detailed schedule of planned Nordic activities is
- (6) attached in the appendix."
- (7) Do you know what this page -- where this
- (8) page came from? It appears it's from a larger
- (9) document.
- (10) A I'm not certain what the -- what the full
- (11) document is. I mean it looks like it might be a
- (12) business plan for the part, but I can't be certain
- (13) just from looking at this.
- (14) Q Looking down at some of the milestones,
- (15) "Current Thinking" strawman presentations to
- (16) potential beta sites, September '93, done."
- (17) What is your understanding of that -- the
- (18) first -- I guess the first bullet point or listing?
- (19) A Well, I think that's the same thing that the
- (20) late August meetings with the key Japanese potential
- (21) customers were, and then there were, as we discussed
- (22) earlier, some U.S. customers that would have been
- (23) involved, too.
- (24) So what that says to me is that there was
- (25) a plan to complete that pass by September, and that

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- (1) all of those customers were given that strawman
- (2) presentation in that time period.
- (3) Q What is your understanding of the second item,
- (4) "Major Function Specification Closed, October '93,
- (5) done"?
- (6) A That there was a functional specification that
- (7) described the major functions but not necessarily all
- (8) the details that was completed by the end of October.
- (9) Q The next item, "Initial Datasheet for Beta
- (10) Sites," what is your understanding of that item?
- (11) A That that would be a preliminary version of a
- (12) data sheet that was given to that select set of
- (13) customers.
- (14) Q That was done in November of '93?
- (15) A Apparently so, yes.
- (16) Q Then the next item, "Presentation of Completed
- (17) Nordic Spec to Beta Sites, November '93," and then
- (18) under "status" it says "done," what is your
- (19) understanding of that item?
- (20) A Well, there must have been a Nordic spec
- (21) document, it would appear, in addition to the data
- (22) sheet. But I would think that they would have to a
- (23) great extent the same -- would be the same
- (24) information in a different form.
- (25) Q What's the difference between a data sheet and

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- (1) the Nordic specification?
- (2) A Well, a data sheet tends to follow sort of a
- (3) prescribed format within a company, or at least
- (4) within a part of a company, so that there's some
- (5) uniformity; whereas the spec would be more of an
- (6) ad hoc document.
- (7) So as I said, I think they were probably
- (8) essentially different versions of the same
- (9) information, which would be the features of the
- (10) device, and perhaps -- I don't know -- the data sheet
- (11) might have things like supply voltage levels on it
- (12) and other perimetric information that the spec
- (13) probably wouldn't. But I would think the core of
- (14) both of them would be a list of features.
- (15) Q Did you check your files to see whether or not
- (16) you had a copy of any of these specifications or data
- (17) sheets?
- (18) A Yes. Yes, I did check, and no, I didn't find
- (19) any copies.
- (20) MS. KORDZIEL: Counsel, if you can look
- (21) to see, first, where the rest of this document might
- (22) be and the detail schedule of planned Nordic
- (23) activities attached in the appendix --
- (24) MR. LEVIN: Mr. Dickinson, do you
- (25) recognize -- is this from one of your files, or can

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- (1) you tell from this first page?
- (2) THE WITNESS: Yes, the first page
- (3) certainly is because that's my handwriting.
- (4) MR. LEVIN: Actually I was referring to
- (5) Bates number 110786, but I think --
- (6) THE WITNESS: Oh.
- (7) MR. LEVIN: If this is your file, can you
- (8) tell?
- (9) THE WITNESS: Yes, that's my file.
- (10) MR. LEVIN: Okay.
- (11) THE WITNESS: And so everything that was
- (12) in that file --
- (13) MR. LEVIN: This is the complete file
- (14) apparently?
- (15) THE WITNESS: Or at least this is one of
- (16) the documents that came from -- maybe it is the
- (17) complete file. I mean I don't -- I don't recall
- (18) exactly -- exactly what was in that file. I think I
- (19) remember these two pages as having been in there, not
- (20) as part of a larger document but just as individual
- (21) pages.
- (22) MS. KORDZIEL: Well, I guess if you can
- (23) find the larger document, and then also the
- (24) presentation, the functional spec, the initial data
- (25) sheet and the completed Nordic spec, that would be

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- (1) appreciated.
- (2) MR. LEVIN: Sounds like a Christmas list.
- (3) MS. KORDZIEL: Well, it would be if we
- (4) got it.
- (5) MR. LEVIN: Okay. We'll keep looking.
- (6) Q (By Ms. Kordziel): Let's turn to the
- (7) next page.
- (8) A Could I just point something out on this page?
- (9) Q Oh, sure.
- (10) A I notice here now that the tape-out dates
- (11) have -- have moved again, because the last reference
- (12) we saw was late January, early February, if I recall
- (13) correctly. And here we're now seeing mid-March
- (14) tape-out completion.
- (15) Q Going to the next page bearing Bates numbers
- (16) 110789 --
- (17) A Yes.
- (18) Q Can you identify this page?
- (19) A I can -- yes, I can tell you what it is.
- (20) Q What is it?
- (21) A It's a cost projections for Nordic that was
- (22) done in late January of '94.
- (23) Q Who is M. Lele?
- (24) A She was one of the user interface finance
- (25) people.

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- (1) Q Is she still with Cirrus?
- (2) A I honestly don't know. I suspect not but I
- (3) don't know that for certain.
- (4) Q Right next to "Nordic Process C8," what does
- (5) the "C8" refer to?
- (6) A CMOS .8 micron.
- (7) Q How are these cost projections derived?
- (8) A Based on the die size and the process of the
- (9) fab assembly, we would make a projection as to the
- (10) number of good die per wafer that we would get. And
- (11) knowing the wafer cost, then we would determine the
- (12) cost for one die, and that's what's in the line
- (13) called "fab."
- (14) Then we would have the cost of packaging
- (15) the part, knowing the number of pins and so forth.
- (16) And that would give us the assembly line. And then
- (17) "other" would be test and overhead.
- (18) Now these were based on estimates of the
- (19) die size at this point in time, because of course we
- (20) did not have a completed design. So this was a cost
- (21) estimate.
- (22) Q What does "ASP" stand for?
- (23) A Average selling price.
- (24) Q Standard margin, what does that refer to?
- (25) A It's the gross margin based on the standard

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- (1) cost. So --
- (2) Q That would be your profit?
- (3) A No, because to get to the actual profit --
- (4) well, it's sometimes called gross profit. But to get
- (5) to the actual profit, you'd have to deduct a lot of
- (6) other expenses and so forth.
- (7) Q These average selling prices or cost
- (8) projections, were they given to customers?
- (9) A No, no. That was what we thought we would be
- (10) able to sell it for on the average, so it didn't
- (11) represent any specific customer of what we thought
- (12) the average selling price would be across the
- (13) customers.
- (14) Q Earlier in one of the exhibits we had discussed
- (15) budgetary pricing --
- (16) A Yes.
- (17) Q -- and how one of the customers had wanted
- (18) budgetary pricing. Was that type of pricing given
- (19) out to other customers?
- (20) A Typically as we went through the kind of
- (21) process we were talking about, there would be some
- (22) back-and-forth on pricing, which would be an attempt
- (23) on our part to find out what it was they felt they
- (24) needed to get, and an attempt on their part to find
- (25) out where we were planning to price it. Generally

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- (1) speaking, both sides would give as little information
- (2) as they could without losing -- losing momentum with
- (3) respect to the other party.
- (4) So I don't recall specifically whether we
- (5) did or we didn't, but there certainly would have been
- (6) some interchange about the prices.
- (7) Q So during the presentations that occurred, for
- (8) example, the end of August and then in November, in
- (9) addition to the presentation of the architecture,
- (10) there would have been some back-and-forth regarding
- (11) the pricing?
- (12) A I wouldn't necessarily say with every customer,
- (13) but certainly during this whole period, there would
- (14) have been some dialogue.
- (15) But just to give you the flavor of it,
- (16) someone -- a customer might say, well, where is this
- (17) going to be priced, and we might say, oh, it will be
- (18) under \$30. That would be a typical type of
- (19) response. And then we would say, you know, what
- (20) price was it that you needed to have? And they would
- (21) say, oh, we need under 20.
- (22) Q So as the features were being defined, the
- (23) pricing was also being discussed with the customers?
- (24) A In the sense that I was describing earlier, in
- (25) terms of I would say price expectations and price

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- (1) ranges, as opposed to -- certainly it wasn't anything
- (2) that you would characterize as a pricing negotiation.
- (3) Q Do you have any correspondence relating to this
- (4) exchange of pricing?
- (5) A No, I don't. If I had, I would have -- I would
- (6) have produced it as I went through the files.
- (7) Q Would this person, Mr. or Ms. Lele, would they
- (8) would have been involved in any of that discussion?
- (9) A No, she was basically a financial analyst, and
- (10) it looks to me like she would have been on the cost
- (11) accounting side.
- (12) Q Who else would have been involved in those
- (13) types of pricing discussions?
- (14) A The marketing and the sales people would have
- (15) had some involvement, although with the customer, it
- (16) would have been the sales people. But internally it
- (17) would have involved the marketing people.
- (18) Q Do you know some of the names of those sales
- (19) people?
- (20) A The only one that I can positively recall is
- (21) Kimio Fujii.
- (22) Q He's still with the company; is that correct?
- (23) A Yes.
- (24) MS. KORDZIEL: Counsel, if you can check
- (25) his records for any relevant documents, that would be

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- (1) helpful.
- (2) MR. LEVIN: I'll look into that.
- (3) Q (By Ms. Kordziel): So this average
- (4) selling price, would that have been given out to the
- (5) customers?
- (6) A No.
- (7) Q Also at the very bottom here there's a file
- (8) name, NRDC8 dot XLS. Do you know what that file name
- (9) refers to?
- (10) A No, no, I don't. Well, I can speculate.
- (11) Q Would there have been a Nordic database?
- (12) A Well, I just think this is a file for -- as I
- (13) look at it now, for the C8 Nordic cost estimate.
- (14) That's what I would guess.
- (15) Q This is dated January 21st, 1994?
- (16) A Yes.
- (17) Q Turning to the next page, Bates number 110790,
- (18) this is another product cost projection by M. Lele.
- (19) Going up to the very top, "process," it's "C6-3LM."
- (20) What does that refer to?
- (21) A CMOS .6 micron 3-level metal.
- (22) Q Why is that a different process from the C8?
- (23) What's the distinction between the C8 process that's
- (24) referenced on the previous page and this process?
- (25) A The feature size is 25 percent smaller in this

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- (1) process, so it's a finer geometry, higher density
- (2) process.
- (3) Q Is this process specific to the Nordic product?
- (4) A No. No, it's not.
- (5) Q Looking down at some of the items here,
- (6) "Volumes in KU." What does that refer to?
- (7) A Volume in thousands of units.
- (8) Q The "ASP" is the average selling price that we
- (9) talked about?
- (10) A Yes. And again, these are -- these are "what
- (11) if" analyses here. So the ASP is an assumption,
- (12) not -- not something that has a -- some factual
- (13) underpinning so you can go and say here's how we got
- (14) that. It's an exercise in saying if the ASP is \$25,
- (15) in fiscal Q3 of FY95, and all these other things
- (16) hold, what will be the cost and therefore the margin
- (17) on this product.
- (18) Q Here it says, I believe, "in millions"? What
- (19) does that refer to?
- (20) A Revenue. So that would be the number of units
- (21) times the ASP.
- (22) Q Cost of sales, what would that refer to?
- (23) A The number of units times the cost.
- (24) Q What does the cost unit shipped refer to?
- (25) A It looks like cost per unit shipped --

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- (1) Q Oh, I'm sorry.
- (2) A -- because of the slash there. So again the
- (3) fab would be the cost of the die, the assembly would
- (4) be the packaging cost, and then you have test at the
- (5) die and the package part level, freight cost,
- (6) amortization of tooling, packing material, and then
- (7) overhead. So that's what all those categories
- (8) represent.
- (9) Q What does "Fav" and then in parentheses "Unfav
- (10) budget" refer to?
- (11) A Favorable or unfavorable. You see the line
- (12) that says "budget," and these nothing there, there's
- (13) zero there. That would be if the -- if you had a
- (14) budget that assumed a certain cost, then the last
- (15) line would tell you whether it was better or worse
- (16) than the -- what was in the budget.
- (17) Q Why does it say fiscal year '94?
- (18) A I think it doesn't -- doesn't it say --
- (19) Q At the very bottom.
- (20) A Oh, I see. Probably because it's an old
- (21) format, because if you look at the top on the
- (22) left-most column, it says '94 there, and it was
- (23) handmarked '95. Do you see where the "5" is
- (24) handwritten in?
- (25) Q Okay.

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- (1) A So I assume that it was an old template that
- (2) was being used and had to be -- had to be corrected.
- (3) Q What was the purpose of the product cost
- (4) projections?
- (5) A To assess the attractiveness of the product
- (6) from a financial standpoint, given a whole set of
- (7) assumptions. That's why I said it was sort of a
- (8) "what if" analysis.
- (9) Q Would it also help the sales people in their
- (10) pricing discussions with customers?
- (11) A Indirectly, because this would be looked at by
- (12) the business and marketing people, and if the sales
- (13) people came in and said the customer needs this kind
- (14) of price, they would look at that and say, well, it
- (15) looks good financially or it doesn't look good. And
- (16) then there would have to be some discussion about
- (17) what we were willing to do or what we weren't willing
- (18) to do. But this was not used by the salesmen
- (19) directly.
- (20) MS. KORDZIEL: Let's have this document
- (21) marked Exhibit Number 12.
- (22) (Marked for identification: Respondent's
- (23) Exhibit Number 12.)
- (24) Q (By Ms. Kordziel): Can you identify
- (25) this document?

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- (1) A Yes.
- (2) Q What is it?
- (3) A It is conveying to a number of people
- (4) associated with our Pixel products an RFP from IBM
- (5) Japan for a video module.
- (6) Q Why were the people from the Plano division or
- (7) Pixel being -- strike that -- why were they involved
- (8) in this IBM proposal?
- (9) A Because we believed that we would need to use
- (10) some of the Pixel video products to respond to the
- (11) IBM request.
- (12) Q Which Pixel products in particular?
- (13) A I don't remember the designations, but they had
- (14) a couple of products that were basically video
- (15) processing chips. But I don't remember the numbers.
- (16) They were separate from the products that we have
- (17) been talking about. They were distinct from the
- (18) products that we have been talking about.
- (19) Q So Mr. Nally and Mr. Schafer weren't involved
- (20) in the Nordic development?
- (21) MR. LEVIN: Objection. Misstates the
- (22) testimony.
- (23) Q (By Ms. Kordziel): Or were they
- (24) involved?
- (25) A I think I said earlier that none of the Plano

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- (1) people were on the Nordic development team, that they
- (2) were working on their own project.
- (3) They were involved to the extent that
- (4) there was some level of communication between the two
- (5) projects. But I would also say that this document
- (6) has nothing to do with that involvement.
- (7) Q I see. What involvement did they have? Can
- (8) you be more specific?
- (9) A The one thing that I can recall is that there
- (10) were some discussions between the two groups as to
- (11) the approaches that they were taking to architect and
- (12) implement the video functionality.
- (13) My recollection is that they were taking
- (14) different approaches, and didn't necessarily agree on
- (15) what the right approach was.
- (16) Q Do you know what the difference in approaches
- (17) was between the Plano group and the Fremont group?
- (18) A No, I don't know. I think it was -- it had to
- (19) do with the best way to implement some of the
- (20) functions that we've been talking about. If I ever
- (21) knew the distinctions, I certainly don't recall them
- (22) now.
- (23) Q Let's turn to bullet number one. It states
- (24) that "The embedded VGA (at this point the WD90C24 if
- (25) we cannot convince them to switch to Nordic) does not

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- (1) support multimedia capabilities that they want."
- (2) What is your understanding of that statement?
- (3) A That on the Thinkpad 850 that's referred to
- (4) here, IBM was planning to use the Western Digital
- (5) part that we talked about earlier, which did not have
- (6) video capability.
- (7) They wanted to be able to offer video
- (8) functionality as an option on this machine, and they
- (9) were hoping to be able to find an add-on module of
- (10) some form that would allow them to do that. That's
- (11) what this RFP was all about.
- (12) Q At that time was Cirrus trying to convince them
- (13) to switch to Nordic?
- (14) A Yes.
- (15) Q Who is Gerald W.?
- (16) A Gerald Wineinger was a marketing person at
- (17) Pixel.
- (18) Q Does he still work for Cirrus?
- (19) A No.
- (20) Q Do you know who John N. refers to?
- (21) A Oh, John N.? You're right. Oh, John Nijima,
- (22) that must be who that is.
- (23) Q Does he still work at Cirrus?
- (24) A No.
- (25) Q Was he also in marketing?

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- (1) A No, he was in engineering at Pixel.
- (2) Q What was Dennis Jow in charge of or what were
- (3) his responsibilities?
- (4) A He was the product or marketing manager for
- (5) Nordic.
- (6) Q Do you know when he left Cirrus?
- (7) A It's been a couple of years. I don't recall
- (8) more precisely than that.
- (9) MS. KORDZIEL: Counsel, if you can look
- (10) for Mr. Jow's files, that would be helpful.
- (11) MR. LEVIN: I'll add that to the list.
- (12) Q (By Ms. Kordziel): Turning to the
- (13) next page, what were Bob Conner's responsibilities?
- (14) A He was marketing for portable graphics at that
- (15) point.
- (16) Q Was he involved in the marketing for the Nordic
- (17) product?
- (18) A Yes. I don't recall exactly when he got
- (19) involved. It was probably late in '93, but I don't
- (20) recall exactly.
- (21) Q Are Dennis Jow and Bob Conner on the same
- (22) level, or is one higher up than the other?
- (23) A Dennis would have been -- would have been
- (24) reporting to -- to Bob.
- (25) Q So Bob was in charge of the portable

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- (1) graphics -
- (2) A Marketing.
- (3) Q - marketing, and then Dennis was in charge of
- (4) the Nordic in particular?
- (5) A Right.
- (6) Q Why was Dennis also involved in the Super Video
- (7) Card proposal? Was that related to the Nordic
- (8) product at all?
- (9) A Well, I don't know to what extent Dennis was
- (10) involved in this. I mean I think what we see here is
- (11) that John Nijima at Cirrus Logic KK passed the
- (12) requirements from IBM to Dennis, who then, as we saw
- (13) in the cover sheet, passed them on to Pixel. So I
- (14) don't know whether Dennis was actually much more than
- (15) a conduit at that point.
- (16) In fact my recollection is that whatever
- (17) we were going to propose would be determined by the
- (18) Pixel people and not by the people in Fremont, with
- (19) respect to this module.
- (20) Q At the very end, John Nijima states that he
- (21) will visit IBM on January 11th. Do you know whether
- (22) or not he visited IBM on January 11th?
- (23) A No, I don't know. It's likely that he did, if
- (24) he said he was going to, but I don't know.
- (25) Q Were you involved with the Super Video Card,

- (1) Q (By Ms. Kordziel): Were you familiar
- (2) with the Super Video Card specification?
- (3) A I was familiar with it at a high level, not at
- (4) a detail level.
- (5) Q I've forgotten, I'm not sure if I've asked
- (6) this. Why was it referred to Pixel instead of -
- (7) strike that. Why was it referred to Pixel?
- (8) A It was referred to Pixel because we believed
- (9) that the best way to respond to their request was by
- (10) building or designing a card using Pixel -
- (11) off-the-shelf Pixel components.
- (12) If you take a look at the schedule on the
- (13) second sheet, at the beginning of January, they were
- (14) asking for samples in early April, or roughly, I
- (15) guess, three months later.
- (16) So even if we wanted to for the small
- (17) volumes involved, which as you can see from the
- (18) following paragraph were 10,000 cards a year, there
- (19) would have been no way to either modify a design like
- (20) Nordic or do a new chip design to satisfy this. So
- (21) anything that we could do had to be done with parts
- (22) that either existed or were very close to the end of
- (23) their development.
- (24) Q Turning to page CL 17818 -
- (25) A Okay.

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- (1) this proposal?
- (2) A I was involved from the standpoint of asking
- (3) Pixel to be responsive to this. I was not involved
- (4) in literally preparing the proposal.
- (5) Q Who was involved in preparing the proposal to
- (6) IBM?
- (7) A Well, I think that it - I believe it would
- (8) have come from Jim Fontaine and the other people
- (9) whose names are handwritten on the first sheet. From
- (10) Cirrus Logic KK, Bill Knapp was the technical person
- (11) that was working with them to try and make sure that
- (12) we got a proposal that was responsive.
- (13) MS. KORDZIEL: Counsel, have you been
- (14) able to locate Jim Fontaine's files?
- (15) MR. LEVIN: Jim Fontaine - particular
- (16) files of Jim Fontaine?
- (17) MS. KORDZIEL: Yes.
- (18) MR. LEVIN: I believe we have located
- (19) some files of his, yes.
- (20) MS. KORDZIEL: Those have been produced?
- (21) MR. LEVIN: I believe so.
- (22) MS. KORDZIEL: What about Bob Conner's
- (23) files?
- (24) MR. LEVIN: Bob Conner, I'm not sure
- (25) about his files.

- (1) Q Under number one, "Video Capture," it says
- (2) "Capture Composite NTSC/PAL (Still or Motion image)."
- (3) Is that referring to capturing live video?
- (4) A Yes.
- (5) MR. LEVIN: Objection, lack of
- (6) foundation.
- (7) Q (By Ms. Kordziel): And the next
- (8) bullet point, "Support, YCrCb and RGB." What is your
- (9) understanding of the second bullet point?
- (10) A Those are formats, and - by the context,
- (11) they're formats. Actually the first one is referred
- (12) to I believe as component video. And RGB is red,
- (13) green, blue with different pixel depths. So both of
- (14) the first two bullets refer to video formats.
- (15) Q Under "Video Overlay," number two, in the very
- (16) middle there it states, "Video overlay with color key
- (17) and window registers." What is your understanding of
- (18) that bullet point?
- (19) MR. LEVIN: Objection, lack of
- (20) foundation. There's been no foundational testimony
- (21) about this document.
- (22) MS. KORDZIEL: Well, Mr. Dickinson
- (23) testified that he was familiar with the
- (24) specification.
- (25) MR. LEVIN: Well, maybe that would be a

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- (1) good foundational question, whether he's familiar
- (2) with this specification.
- (3) MS. KORDZIEL: We've already asked that.
- (4) He was copied on page 17812. We've already discussed
- (5) his familiarity.
- (6) MR. LEVIN: You can answer the question.
- (7) MS. KORDZIEL: Can you repeat the
- (8) question?
- (9) (The record was read by the reporter
- (10) as follows: "Under 'Video Overlay,'
- (11) number two, in the very middle there it
- (12) states, 'Video overlay with color key and
- (13) window registers.' What is your
- (14) understanding of that bullet point?")
- (15) THE WITNESS: My understanding is that
- (16) they wanted to be able to use color keying to control
- (17) video overlay, and I can guess what window registers
- (18) mean, but I haven't actually run into that term
- (19) before.
- (20) When I said I was familiar with this, I
- (21) said I was familiar with it in a general sense, not
- (22) at a detail level. So the questions you're asking me
- (23) are actually at a level of detail that I didn't deal
- (24) with this. I dealt with it more in terms of what are
- (25) the functions that they were trying to accomplish in

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- (1) this request that they made of us.
- (2) Q (By Ms. Kordziel): I guess number
- (3) three says "Functional Overview." Would those be the
- (4) functions that you were looking into?
- (5) A The relatively -- relativity of language --
- (6) yeah. The functions that I would have been aware of
- (7) would have been the fact that they wanted to do video
- (8) capture and overlay, and not the specific details
- (9) of -- that are listed underneath those major
- (10) headings.
- (11) Q Do you remember reading this document?
- (12) A I remember looking at this document. I
- (13) probably did not read it word for word. I probably
- (14) passed it at great speed to the nearest technical
- (15) person.
- (16) Q What was the proposal that Cirrus and Pixel put
- (17) together?
- (18) MR. LEVIN: Objection, ambiguous. In
- (19) response to --
- (20) MS. KORDZIEL: This request for proposal.
- (21) THE WITNESS: My recollection is that we
- (22) put together a proposal that said to IBM, if you
- (23) don't use the Western Digital part but use Nordic,
- (24) then we could make a Super Video Card using Pixel
- (25) components that would do all the things that you want

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- (1) to do from a total system standpoint.
- (2) I believe that we said if you're going to
- (3) use the Western Digital part, we don't think that we
- (4) can accomplish everything -- that we know how to
- (5) accomplish everything that you want to accomplish.
- (6) Q (By Ms. Kordziel): Did you see the
- (7) proposal that was given to IBM?
- (8) A Yes.
- (9) Q Do you have a copy of it?
- (10) A No.
- (11) MS. KORDZIEL: We've yet to see that
- (12) proposal.
- (13) MR. LEVIN: Really? What's that dated?
- (14) MS. KORDZIEL: Excuse me?
- (15) MR. LEVIN: What time frame is that from,
- (16) do you know?
- (17) MS. KORDZIEL: I would assume January.
- (18) MR. LEVIN: January of '93?
- (19) MS. KORDZIEL: '94.
- (20) MR. LEVIN: '94.
- (21) Q (By Ms. Kordziel): Can you describe
- (22) it? Was it a memorandum or a -- how in detail was
- (23) it?
- (24) A I'm trying to think back. I'm pretty sure that
- (25) we did a block diagram, and at least a high-level

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- (1) bill of materials, and there would have been some
- (2) description material.
- (3) But whether this was all in the form of a
- (4) document or whether we did it in the form of a
- (5) presentation, I don't -- I don't recall. And we
- (6) would have had some sort of cost -- I mean price
- (7) associated with it.
- (8) But generally speaking, given the
- (9) constraints that they were placing on it, we found it
- (10) both very difficult and not very interesting from a
- (11) business standpoint to actually solve the problem
- (12) that they were trying to solve.
- (13) MS. KORDZIEL: We'll mark this document
- (14) Exhibit Number 13.
- (15) (Marked for identification: Respondent's
- (16) Exhibit Number 13.)
- (17) Q (By Ms. Kordziel): Can you identify
- (18) this document?
- (19) MR. LEVIN: When you say "this document,"
- (20) are you referring to the cover page or the whole --
- (21) MS. KORDZIEL: The whole -- I think it's
- (22) one document.
- (23) MR. LEVIN: Or maybe that would be a good
- (24) question.
- (25) MS. KORDZIEL: 95135 through 95147.

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- (1) THE WITNESS: Well, I believe in fact
- (2) this is the proposal.
- (3) Q (By Ms. Kordziel): You said there
- (4) was not --
- (5) A Or at least -- I mean I don't see anything here
- (6) that has to do with pricing. So let's say at least
- (7) this would be the technical elements of the -- of the
- (8) proposal.
- (9) Q Would this have been like a power point
- (10) presentation or something?
- (11) A Yeah. I mean it's clearly a presentation. I
- (12) don't know whether it was done in power point or not,
- (13) though, but it's of that -- that style of
- (14) presentation.
- (15) Q Were you involved in the presentation?
- (16) A You mean actually in presenting it to IBM?
- (17) Q IBM, yes.
- (18) A I think I was. I think I was. I believe I was
- (19) in Japan at the time.
- (20) Q Do you remember the time frame?
- (21) A Well, I believe it was in January '94 time
- (22) frame. And that's what this is dated.
- (23) Q Turning to the first page, 95135, over to the
- (24) left there's a block captioned "Super Video Card."
- (25) A Right.

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- (1) Q The PX -- were those chips the chips that were
- (2) involved in the Super Video Card?
- (3) A Yes, at least some of them were. These chips
- (4) that were listed here were the Pixel -- the "PX"
- (5) indicates that they're Pixel devices.
- (6) I think if you look at the next page,
- (7) you'll see a very high-level block diagram of our
- (8) proposed Super Video Card.
- (9) Q Do you know what the PX4074 chip referred to?
- (10) A I honestly don't remember which one it was. I
- (11) think in the back of this there are some -- yes,
- (12) 95142 is a summary of what the 4070 chip is.
- (13) Q I guess we'll work our way through. Let's turn
- (14) to page 95138.
- (15) A Okay.
- (16) Q In bullet point number three, it refers to
- (17) Nordic. What is your understanding of that bullet
- (18) point?
- (19) A I think that refers to the point that I was
- (20) making earlier about the possibility -- or our wish
- (21) that IBM replace the Western Digital device with
- (22) Nordic. And I understand this to say that if they
- (23) did that, then that would provide more functionality
- (24) for them.
- (25) Q What were the additional features that Nordic

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- (1) would have provided?
- (2) A Well, the only -- I don't recall any specific
- (3) ones. It obviously notes here that there's a
- (4) hardware cursor capability. But other than that, I
- (5) can't really -- I can't really add anything to that.
- (6) Q Turning to the next page, starting with the
- (7) left-hand side and moving towards the right, the
- (8) NTSC/PAL composite input, that would be the live
- (9) video input?
- (10) A Yes.
- (11) Q The PX4070 decoder would be the decoder for the
- (12) live video data?
- (13) A Right.
- (14) Q I'm assuming the PX2070 and the PX1070 refers
- (15) to the video processor?
- (16) A Right.
- (17) Q Data from the 2070 and the 1070 is then stored
- (18) in a VRAM frame buffer; would that be correct?
- (19) A Correct.
- (20) Q Then the data is retrieved from the VRAM frame
- (21) buffer and then sent to the PX2085 media DAC?
- (22) A Correct.
- (23) Q What was the distinction between using a VRAM,
- (24) a video ram frame buffer, versus a DRAM frame buffer?
- (25) MR. LEVIN: Objection, lack of

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- (1) foundation. Also I'd like to point out, we're
- (2) getting far afield from the deposition topics that
- (3) were noticed.
- (4) MS. KORDZIEL: No, counsel, if you'll
- (5) look at topic number three, the IBM request reference
- (6) in Bates CL 17811 including Cirrus's communications
- (7) with IBM and Cirrus's response to the IBM request,
- (8) that is referencing this document, the IBM proposal.
- (9) So it's definitely a topics that's noticed and
- (10) completely within the scope of that topic.
- (11) MR. LEVIN: Well, Cirrus's communications
- (12) to me signifies a different topic than the technical
- (13) level of detail that you're seeking at this point. I
- (14) think it goes beyond this topic.
- (15) MS. KORDZIEL: And Cirrus's response to
- (16) the IBM request. This is definitely their proposal
- (17) to the IBM request. So I don't really understand
- (18) what your problem is.
- (19) MR. LEVIN: Well, you're going into a
- (20) technical level here that is I think beyond Cirrus's
- (21) communications with IBM and Cirrus's response to
- (22) IBM's request.
- (23) MS. KORDZIEL: Cirrus's response would be
- (24) its proposal to the IBM request. This is a request
- (25) for proposal. Counsel, it's well within the scope of

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- (1) this topic.
- (2) MR. LEVIN: Well, regardless, my
- (3) objection also includes lack of foundation for some
- (4) of these technical questions.
- (5) MS. KORDZIEL: Well, Mr. Dickinson
- (6) testified that he participated in this presentation.
- (7) Can you repeat the last question, please?
- (8) (The record was read by the reporter
- (9) as follows: "What was the distinction
- (10) between using a VRAM, a video ram frame
- (11) buffer, versus a DRAM frame buffer?")
- (12) MR. LEVIN: And I repeat my objection.
- (13) THE WITNESS: As best I can recall, VRAM
- (14) would have been used because of band width
- (15) requirements for the band width required to load the
- (16) buffer with the processed video coming out of the
- (17) 2070 and unload it with data going to the media DAC.
- (18) Q (By Ms. Kordziel): Did this VRAM
- (19) frame buffer contain both video and graphics data?
- (20) A No.
- (21) Q What type of data did it contain?
- (22) A Video.
- (23) Q Turning to the next page, 95140 -
- (24) MR. LEVIN: 95410, did you say?
- (25) Q (By Ms. Kordziel): 95140. The

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- (1) digital video processor, the 1070, under the bullet
- (2) point "Multimedia Features," what was your
- (3) understanding of the video playback acceleration?
- (4) A There are a number of operations that may have
- (5) to be performed to the video, depending on the format
- (6) in which it is stored before it's ready to be
- (7) displayed.
- (8) For example, if it's going to be
- (9) displayed via an overlay on a graphics controller, it
- (10) would have to end up in an RGB format, and might not
- (11) be stored in that form, number one, and it might not
- (12) be stored at the resolution that was going to be
- (13) displayed. And it might even be compressed. So in
- (14) general, playback acceleration could deal with
- (15) hardware acceleration of any of those types of
- (16) operations.
- (17) In terms of the Pixel device here, as far
- (18) as I know, what it would accelerate would be color
- (19) space conversion and scaling. So that's the way that
- (20) I would - based on what I know - interpret that
- (21) term.
- (22) Q When you referred to scaling, would that be
- (23) replication or interpolation?
- (24) A With respect to this device, I honestly don't
- (25) know.

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- (1) Q Undemeath there it says "Multiformat Frame
- (2) Buffer, RGB, YUV." What is your understanding of
- (3) that?
- (4) A My understanding of that would be that it could
- (5) store various video formats in the frame buffer.
- (6) Q The 1070 used a DRAM frame buffer?
- (7) MR. LEVIN: Objection, lack of
- (8) foundation.
- (9) THE WITNESS: Well, if I look at this
- (10) diagram, it implies that it could use either VRAM or
- (11) DRAM. But that's - I don't have any recollection
- (12) other than what's on this slide as to what form of
- (13) memory it used.
- (14) Q (By Ms. Kordziel): What does it mean
- (15) when it says "Eliminates GENLOCK requirements"?
- (16) MR. LEVIN: Objection, lack of
- (17) foundation.
- (18) THE WITNESS: I don't know.
- (19) Q (By Ms. Kordziel): Turning to the
- (20) next page, 95141, under "Multimedia Features," this
- (21) also states "Multiformat frame buffer (RGB, YUV)."
- (22) What is your understanding of that feature?
- (23) A The same as my understanding on the previous
- (24) slide, because when I look at the data path on this,
- (25) it's pretty clear, or it seems clear to me, that

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- (1) what's going through the frame buffer is video. So I
- (2) would interpret that to mean different color space
- (3) formats for the video.
- (4) Q So it could store both RGB and YUV in the frame
- (5) buffer?
- (6) A Right. They could store a video stream in YUV
- (7) or RGB formats in the frame buffer, would be my
- (8) interpretation of that.
- (9) Q Turning to Bates number 95143, this refers to
- (10) the 4072. What is a decoder used for?
- (11) MR. LEVIN: Objection, lack of
- (12) foundation. Are you referring to the decoder here or
- (13) decoders in general?
- (14) MS. KORDZIEL: On this page that we just
- (15) referred to, 95143, the Pixel 4072.
- (16) THE WITNESS: That it would take a live
- (17) video input, which would be analog, by the way, and
- (18) convert it to a digital video stream.
- (19) Q (By Ms. Kordziel): Over on the
- (20) right-hand side there are two blocks. Does that
- (21) refer that the 4072 could be used with the Alpine,
- (22) Everest, Madderhorn graphics controllers?
- (23) MR. LEVIN: Objection, lack of
- (24) foundation.
- (25) THE WITNESS: I would interpret this as

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- (1) meaning that the digital output from the decoder
- (2) could be connected to a video input port on one of
- (3) those controllers.
- (4) Q (By Ms. Kordziel): Turning to the
- (5) next page, 95144, this refers to the Ptxel 2085 media
- (6) DAC. What is the Ptxel 2085 media DAC?
- (7) MR. LEVIN: Objection, lack of
- (8) foundation.
- (9) THE WITNESS: It appears to be able to
- (10) take multiple streams of images or streams coming
- (11) from multiple sources and merge them into a single
- (12) stream for display purposes. This would be - I
- (13) would consider this an overlay type of capability.
- (14) Q (By Ms. Kordziel): On the right-hand
- (15) side under "Multimedia Features," it refers to
- (16) "multiformat frame buffer (RGB/YUV)." What is your
- (17) understanding of that feature?
- (18) A Frankly I don't understand it, because looking
- (19) at this block diagram, I don't see where that would
- (20) come into the picture. No pun intended.
- (21) Q So you don't know?
- (22) A In this context, that doesn't make sense to
- (23) me. It may be my ignorance, but -
- (24) Q What does the last statement, "Eliminates
- (25) GENLOCK requirements," what is your understanding of

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- (1) that statement?
- (2) A Again, I honestly don't know what that refers
- (3) to.
- (4) Q Turning to 95146, was Everest also proposed to
- (5) IBM?
- (6) MR. LEVIN: Objection. "Proposed" is
- (7) ambiguous.
- (8) MS. KORDZIEL: Well, this was the
- (9) proposal to IBM, so -
- (10) THE WITNESS: Well, I believe that the
- (11) context that we have here is the - the first page is
- (12) a roadmap of projected future projects. So if you're
- (13) saying was Everest proposed in January of '94 to IBM,
- (14) the answer would be no, it was not proposed to IBM.
- (15) It was just indicated as a future intention that
- (16) would allow evolution of their product line over
- (17) time. But it wasn't - certainly wasn't in the form
- (18) where it could be proposed.
- (19) Q (By Ms. Kordziel): Why was Everest
- (20) mentioned during the presentation and not Nordic,
- (21) since Nordic was a precursor to Everest?
- (22) A I have to believe that it was because they
- (23) didn't know anything about our concept for Everest,
- (24) and yet - and we had been giving them a continual
- (25) stream of information about Nordic. So we were

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- (1) introducing the concept of Everest at this point to
- (2) show them that there was a continuity going forward.
- (3) There was a growth path going forward.
- (4) Q I see.
- (5) A Actually there's one other point, and that is
- (6) that if you go back to the first sheet, you'll see
- (7) that we were also proposing - I will retract the
- (8) word "proposing" because I meant it in a different
- (9) sense, but I don't want to be -
- (10) Q It was part of the presentation?
- (11) A Yes. We were showing that our intention was to
- (12) actually incorporate some of the functions that were
- (13) in discrete Ptxel chips in January into the Everest
- (14) product roughly a year later. So that was showing an
- (15) integration path, is the term that we use.
- (16) Q Do you know what some of those functions from
- (17) the Ptxel products that were being integrated into
- (18) the Everest products were?
- (19) MR. LEVIN: Objection, misstates the
- (20) testimony.
- (21) THE WITNESS: I mean I can - I can make
- (22) a - a good guess based on just looking at the
- (23) information that's here, but I do not have a specific
- (24) recollection of what those specific features were.
- (25) Q (By Ms. Kordziel): What is your

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- (1) guess of the features?
- (2) A You'll have to give me a second to formulate
- (3) it.
- (4) It would appear we were saying that we
- (5) thought we'd put some of the decoding capability
- (6) into - into Everest, if I look at this line. But -
- (7) and some of the video processing capability at that
- (8) point in time was clearly - how shall I put this? -
- (9) very, very conceptual. Some of it happened and some
- (10) of it didn't happen, so it was a very - it was an
- (11) indication of the direction that we were taking as
- (12) opposed to a very definitive outline of what would
- (13) actually happen.
- (14) Q (By Ms. Kordziel): Also with respect
- (15) to the Everest that's depicted on 95146 under
- (16) "multimedia features" it refers to multiformat frame
- (17) buffer, RGB/YUV. What is your understanding of that
- (18) feature?
- (19) A Well, I believe that the multiformat frame
- (20) buffer in Everest was essentially the same as in
- (21) Nordic.
- (22) Now there probably were some differences
- (23) that escape me at this point in time. But I think
- (24) the way that this is formatted, as I read through
- (25) this, is that this was prepared basically by the

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- (1) Pixel people, and they had sort of a standard format
- (2) that they kept repeating the same things again and
- (3) again and again. So the meaning might be a little
- (4) different, but they put it in the same place.
- (5) So in the case of Everest, I would say
- (6) that what's being referred to there is generically
- (7) the kind of graphics video frame buffer that we've
- (8) talked about before in the context of Nordic; whereas
- (9) on other pages where it talks about multiformat frame
- (10) buffer, it's talking about being able to store
- (11) different formats of video data. So I think it's
- (12) misleading from that standpoint. Or confusing. Let
- (13) me not say misleading, confusing.
- (14) Q Turning to the last page, Bates number 95147
- (15) refers to the Madderhorn?
- (16) A Yes.
- (17) Q The Madderhorn was part of the presentation to
- (18) IBM for the same reason that the Everest was part of
- (19) this presentation? They wanted to show the
- (20) continuation of the product?
- (21) MR. LEVIN: Objection, misstates the
- (22) testimony.
- (23) THE WITNESS: I think in the case of
- (24) Madderhorn, the main point that we were trying to
- (25) make was that we would have a higher performance

- (1) Number 14.
- (2) (Marked for identification: Respondent's
- (3) Exhibit Number 14.)
- (4) Q (By Ms. Kordziel): Can you identify
- (5) the document bearing Bates numbers CL 57850 through
- (6) 57866?
- (7) A Well, it looks like -- desktop graphics
- (8) customer presentation. I don't know whether I've
- (9) seen it before or not. I may have but I'm not
- (10) certain.
- (11) Q The presentation is discussing the 5440
- (12) product; is that correct?
- (13) A It starts off with the 5440. I don't know if
- (14) it -- looks like it's all 5440. Oh, no, no. At the
- (15) end, 5436.
- (16) Q The 5436 is a later -- product later than the
- (17) 5440; is that correct? No, actually, strike that.
- (18) A Yeah, I would guess that they're fairly
- (19) contemporaneous based on the fact that they're in the
- (20) same presentation.
- (21) Q Turning to the page bearing 57860 --
- (22) A Okay.
- (23) Q And then referring back to page 57859 --
- (24) A 859?
- (25) Q Right.

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- (1) follow-on version after Everest, because Everest was
- (2) a 32-bit graphics engine and Madderhorn a 64-bit
- (3) graphics engine.
- (4) So that would have provided the boost in
- (5) performance.
- (6) Q (By Ms. Kordziel): The multiformat
- (7) frame buffer that's referred to on page 95147 is the
- (8) same multiformat frame buffer with respect to the
- (9) Nordic; is that correct?
- (10) MR. LEVIN: Objection, misstates the
- (11) testimony.
- (12) THE WITNESS: It would be generically the
- (13) same in terms of providing the same function, but
- (14) would be presumably different in detail, because the
- (15) data path bits would be different and so --
- (16) Q (By Ms. Kordziel): The bits?
- (17) A Right.
- (18) MS. KORDZIEL: Do you want to take a
- (19) short five-minute break?
- (20) THE WITNESS: Yes.
- (21) MS. KORDZIEL: Let's go off the record.
- (22) (A recess was taken.)
- (23) MS. KORDZIEL: Let's go back on the
- (24) record.
- (25) I'd like to have this marked as Exhibit

- (1) A Okay. Okay.
- (2) Q The document Bates numbered 859, 578789, refers
- (3) to a flat frame buffer approach. 57860 refers to the
- (4) 5440 multiformat frame buffer. What's the advantage
- (5) of the 5440 multiformat frame buffer?
- (6) MR. LEVIN: Objection, lack of
- (7) foundation. There's been no establishment of any
- (8) advantage either way, plus the foundational
- (9) questions -- I mean you're testifying as to the
- (10) contents of these sheets, and I know we want to speed
- (11) things up, but still, he should make the testimony.
- (12) Q (By Ms. Kordziel): That's fine.
- (13) What are the distinctions between the flat frame
- (14) buffer and the 5440 multiformat frame buffer?
- (15) A Actually I don't recall having heard the term
- (16) "flat frame buffer" before.
- (17) Q Do you know what a flat frame buffer is?
- (18) A "Flat" would imply to me that the color depth
- (19) is the same across the entire frame buffer. So I
- (20) would surmise that -- well, actually there's a lot of
- (21) nomenclature here that I'm not -- not familiar with.
- (22) But what I would surmise is that it's
- (23) talking about the same thing that we talked about
- (24) earlier with respect to Nordic, where the ability to
- (25) have different graphics and video formats in the same

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- (1) frame buffer has both size and performance
- (2) advantages.
- (3) Q You're referring to the multiformat frame
- (4) buffer in that exhibit?
- (5) A Right, I am, yes.
- (6) Q Do you know what the on-screen memory and the
- (7) off-screen memory is referring to?
- (8) A Yes. There's a -- in a frame buffer, there's a
- (9) portion of the frame buffer that is scanned with a
- (10) raster scan that corresponds to the scan lines on a
- (11) CRT. And that's referred to as on-screen memory.
- (12) Then the rest of the frame buffer is
- (13) off-screen, and you can get data onto the screen
- (14) basically by using a BitBLT, by BLT'ing it into the
- (15) viewable portion of the frame buffer, if that makes
- (16) any sense.
- (17) Q Do you know whether or not the Nordic, the 7542
- (18) product, whether its frame buffer has on-screen and
- (19) off-screen memory?
- (20) A Basically just about every PC graphics frame
- (21) buffer has off-screen memory, because the screen
- (22) resolution and the frame buffer size are essentially
- (23) never the same. And in fact when you have different
- (24) graphics modes which represent different screen
- (25) resolutions, you've got to have a frame buffer that

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- (1) will accommodate the largest resolution. But then --
- (2) even then it generally will not be exactly the same
- (3) size as the frame buffer.
- (4) So there's pretty much always some
- (5) off-screen memory. But it will vary, the amount and
- (6) the location of that will vary depending on the
- (7) specifics.
- (8) Q So your answer to the question whether or not
- (9) the Nordic product would have on-screen/off-screen
- (10) memory --
- (11) A It would have off-screen memory, I'm pretty
- (12) certain of that.
- (13) Q Would this document be a type of presentation
- (14) that would have been presented to customers?
- (15) MR. LEVIN: Objection, calls for
- (16) speculation.
- (17) THE WITNESS: It looks to me like the
- (18) style of presentation that we would have used for
- (19) customers.
- (20) Q (By Ms. Kordziel): Do you know when
- (21) the date of this document would have been?
- (22) A No, I don't. And as I look through it, I don't
- (23) believe that I've seen this particular presentation
- (24) before.
- (25) MS. KORDZIEL: Let's have this marked as

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- (1) Exhibit 15.
- (2) (Marked for Identification: Respondent's
- (3) Exhibit Number 15.)
- (4) Q (By Ms. Kordziel): It's a document
- (5) bearing Bates numbers 99791 through 99811.
- (6) Can you identify this document, Mr.
- (7) Dickinson?
- (8) A Well, the only time that I recall having seen
- (9) it was in a review of documents that we had produced
- (10) for this deposition. And so all I know about it is
- (11) what it says.
- (12) Q Did this document come from your files?
- (13) A No, this document did not come from my files.
- (14) MS. KORDZIEL: Also I note that it starts
- (15) with page 11. It seems to be a portion, the section
- (16) 4.4, of a larger document.
- (17) Counsel, if you could look for the rest
- (18) of this document --
- (19) MR. LEVIN: This is the way it was
- (20) produced, in this form?
- (21) MS. KORDZIEL: Uh-huh.
- (22) MR. LEVIN: Okay.
- (23) MS. KORDZIEL: They're consecutive Bates
- (24) numbers.
- (25) MR. LEVIN: Right. There was nothing

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- (1) preceding this; is that correct? I mean this is the
- (2) way it started, I suppose?
- (3) MS. KORDZIEL: I can't remember what
- (4) preceded it, but I don't think it was part of this --
- (5) MR. LEVIN: I see.
- (6) MS. KORDZIEL: It might have been in a
- (7) larger file, but there were no other pages with this,
- (8) page ten, this document.
- (9) Also at the bottom there it says -- it's
- (10) dated February 13, 1994, and it's revision 5.2.
- (11) THE WITNESS: Yes.
- (12) MS. KORDZIEL: Could you also look for
- (13) the previous provisions?
- (14) MR. LEVIN: Believe me, we have been
- (15) looking for all the revisions.
- (16) Q (By Ms. Kordziel): Would this be the
- (17) type of design specification that we were talking
- (18) about earlier with respect to design specs that were
- (19) given out to customers?
- (20) A No. A specification like this would be very
- (21) closely held. In fact, I'm sure that I never saw it
- (22) before a couple of days ago. And we absolutely would
- (23) not give something like this to our customer.
- (24) Q At the middle of the page, it's 4.4, "Nordic 1M
- (25) Motion Video Architecture." That would be referring

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- (1) to the Motion Video Architecture that we've been
- (2) discussing earlier today?
- (3) A I would assume so, yes.
- (4) Q Sasha Egli, is that person the Sasha that you
- (5) referred to earlier but I don't think we ever got the
- (6) last name?
- (7) A Right. I believe it is.
- (8) Q Rakesh Bindlish, what were his
- (9) responsibilities?
- (10) A He was another member of the engineering team.
- (11) Q He was a member of the Nordic design group?
- (12) A I don't know, other than this would lead me to
- (13) believe that he was.
- (14) Q Do you know whether Mr. Bindlish is still at
- (15) Cirrus?
- (16) A I know that he's not.
- (17) MS. KORDZIEL: Counsel, if you could try
- (18) to locate Mr. Bindlish's files, or have you already
- (19) looked?
- (20) MR. LEVIN: We've certainly looked. You
- (21) know, part of my problem in responding to those
- (22) questions, sometimes when we find boxes, even when
- (23) it's relevant material, it's sometimes very difficult
- (24) even to determine whose box it was.
- (25) MS. KORDZIEL: Uh-huh.

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- (1) MR. LEVIN: So those are very difficult
- (2) questions to answer, because we found many boxes that
- (3) have not been labeled as to source in what you could
- (4) describe loosely as archives.
- (5) MS. KORDZIEL: Are there any computer
- (6) archives at Cirrus?
- (7) MR. LEVIN: Yes, there are. And in the
- (8) next few days we'll be turning over more computer
- (9) files.
- (10) MS. KORDZIEL: For example, design
- (11) documents, would those have been archived for the
- (12) Nordic product?
- (13) MR. LEVIN: I believe that's possible.
- (14) But we're still -- it's been very difficult. It's
- (15) taken quite a long time to gather the computer files
- (16) and review them and organize them. But we will be
- (17) producing those in the next couple days. So then
- (18) we'll know for sure.
- (19) Q (By Ms. Kordziel): Do you know what
- (20) the Sashapak referred to?
- (21) A I know that it was a compression algorithm that
- (22) Sasha came up with. And that's -- that's about what
- (23) I know about it. I believe for -- for video.
- (24) MR. LEVIN: One thing I feel I need to
- (25) point out for the record, if this was the only

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- (1) section produced, it certainly seems to be relevant.
- (2) So if we were I think to pull something out, this
- (3) would be by far the most relevant. I can't imagine
- (4) why there would be another part of this that was not
- (5) produced.
- (6) MS. KORDZIEL: Right. The first few
- (7) pages, and also it seems to stop at page 24, but it
- (8) doesn't -- that doesn't seem to be a natural ending.
- (9) MR. LEVIN: Right, it's followed by 31,
- (10) 32, apparently. Or no, that's a different revision
- (11) number.
- (12) MS. KORDZIEL: 31 is a different
- (13) document.
- (14) THE WITNESS: Different document, it
- (15) looks like.
- (16) MS. KORDZIEL: It's an engineering
- (17) specification from Nordic, the register definitions.
- (18) Also it's only a section. We're missing the first
- (19) few pages, the first 30 pages and the pages after
- (20) that.
- (21) MR. LEVIN: I will go back to the
- (22) original documents and see if there's a reason. I'll
- (23) let you know on Monday what the story is.
- (24) MS. KORDZIEL: Okay. It's also revision
- (25) two, and there's a copyright, 1993. So if you can

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- (1) find an earlier revision --
- (2) MR. LEVIN: Uh-huh.
- (3) MS. KORDZIEL: -- perhaps the 1993
- (4) revision, that would be very helpful, of the register
- (5) definitions.
- (6) MR. LEVIN: Okay.
- (7) MS. KORDZIEL: It's dated February 13,
- (8) 1994, but it appears that there was another earlier
- (9) revision.
- (10) MR. LEVIN: Okay.
- (11) MS. KORDZIEL: Especially the earlier
- (12) revisions of the Nordic design specification previous
- (13) to 5.2 would be greatly helpful.
- (14) Q (By Ms. Kordziel): Let's turn to the
- (15) page bearing Bates number 99805.
- (16) A Okay.
- (17) Q Have you ever seen this functional diagram
- (18) before?
- (19) A Only the other day, as I said, when I was
- (20) looking at the documents, that -- some of the
- (21) documents, I should say, that had been produced.
- (22) Q Turning to the previous page, 99804, we had
- (23) talked about earlier with respect to the Nordic using
- (24) window position to control where the video window
- (25) would be. Is that what this page is referring to,

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- (1) using addressing to determine the position of the
- (2) video window?
- (3) MR. LEVIN: Object, lack of foundation.
- (4) THE WITNESS: Okay. I don't know. I'm
- (5) not familiar with the contents of this page.
- (6) MS. KORDZIEL: Turning back to 9985 -
- (7) 805 - I'd like to have this marked as Exhibit 16.
- (8) (Marked for identification: Respondent's
- (9) Exhibit Number 16.)
- (10) MR. LEVIN: Well, I'm going to object to
- (11) this being introduced as an exhibit, and I can only
- (12) imagine what's coming. Well, I can imagine what's
- (13) coming.
- (14) But if you're planning to ask questions
- (15) about interpreting the patent or whether there's any
- (16) patent-related issues here, I don't consider those
- (17) properly noticed under this deposition notice, so
- (18) maybe I should wait for the -
- (19) MS. KORDZIEL: We did notice the
- (20) development of the 7542, and this is definitely a
- (21) design spec document for the Nordic product.
- (22) MR. LEVIN: Right. I've allowed you to
- (23) ask questions about Exhibit 15.
- (24) Exhibit 16, I'm gravely concerned about
- (25) its introduction here. I'm willing to wait to hear

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- (1) the question, but I just want to put you on notice.
- (2) MS. KORDZIEL: Your objection is noted.
- (3) Q (By Ms. Kordziel): Mr. Dickinson,
- (4) are you familiar with - can you identify Exhibit 16?
- (5) A I don't believe I've seen it before. I mean I
- (6) can see what it describes itself to be.
- (7) Q Are you familiar with the patent number
- (8) 5,608,864, the Bindish patent?
- (9) MR. LEVIN: Objection, asked and
- (10) answered. He just testified he hasn't seen this
- (11) before, so -
- (12) Q (By Ms. Kordziel): Have you seen
- (13) this before?
- (14) A No, I have not.
- (15) Q *** Looking at the picture on the first page,
- (16) would you say that was very similar to the picture
- (17) that's shown on Cirrus Bates number 99805?
- (18) MR. LEVIN: Objection. This is exactly
- (19) the area that I will not allow this witness to go
- (20) into. That question is directly targeted at
- (21) infringement and patent-related issues that are not
- (22) noticed for this deposition.
- (23) He's testified he's never seen this
- (24) patent before. I will not allow him to answer that
- (25) question. I instruct him not to answer.

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- (1) MS. KORDZIEL: You're instructing the
- (2) witness not to answer?
- (3) MR. LEVIN: Yes.
- (4) Q (By Ms. Kordziel): Going back to the
- (5) front page, Cirrus 99791, it states that Sasha Egik,
- (6) Rakesh Bindish, Vlad Bril and Dave Keene are
- (7) important contributors to the Motion Video
- (8) Architecture definition. Are there any other people
- (9) who were important contributors to the MVA
- (10) definition?
- (11) MR. LEVIN: Objection, lack of
- (12) foundation, best evidence rule, the document speaks
- (13) for itself. Furthermore, he's testified he never saw
- (14) this document until a few days ago. I think I said
- (15) lack of foundation.
- (16) THE WITNESS: Could I - shall I -
- (17) MR. LEVIN: You can answer.
- (18) Q (By Ms. Kordziel): You can answer.
- (19) MR. LEVIN: You can answer the question.
- (20) THE WITNESS: Right. I want to clarify
- (21) something. Are you talking about from a product
- (22) planning perspective or technical, architectural
- (23) perspective?
- (24) Q (By Ms. Kordziel): Technical,
- (25) architectural definition.

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- (1) A Okay. I'm not - I don't - I don't have a
- (2) recollection of anyone else being a contributor to
- (3) that, but I wouldn't necessarily know everyone who
- (4) had contributed.
- (5) What I would assume is that based on
- (6) what's written here, that the important contributors
- (7) have been - have been acknowledged. But that would
- (8) be a conclusion that I was drawing from this rather
- (9) than from direct knowledge.
- (10) Q The Motion Video Architecture definition, was
- (11) that designed for the Nordic product?
- (12) MR. LEVIN: Objection, lack of
- (13) foundation.
- (14) THE WITNESS: The way that I would answer
- (15) that question is to say that there was a - a video
- (16) architecture that was designed for the Nordic
- (17) product. And the term "Motion Video Architecture" is
- (18) actually a marketing term.
- (19) So I think that what we're seeing here is
- (20) that marketing term having been adopted to describe
- (21) the technical architecture that these people came up
- (22) with. And so when we encounter "Motion Video
- (23) Architecture," depending upon the context, it may be
- (24) talking about the marketing message that's trying to
- (25) be sent to customers, which - for example, in a

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- (1) customer presentation, that's the way that I would
- (2) look at it. Here it's being used as a label for the
- (3) architectural work that has been done by these people
- (4) as part of the Nordic development.
- (5) So they're related, but somewhat
- (6) different meanings for the term.
- (7) Q (By Ms. Kordziel): As far as the
- (8) marketing term, "Motion Video Architecture," when was
- (9) that term coined, I guess, or who came up with the
- (10) term and when?
- (11) MR. LEVIN: Objection, compound question.
- (12) Q (By Ms. Kordziel): Do you know who
- (13) came up with that term?
- (14) A I remember being in meetings in I would think
- (15) late '93 where we were talking about how to market
- (16) the multimedia or the video functionality, and that
- (17) one or another of the marketing people -- I don't
- (18) think this was the first suggestion, but this is what
- (19) it evolved into.
- (20) So I don't remember exactly who proposed
- (21) it, but I think it was probably as we were in our
- (22) product and marketing planning discussions in late
- (23) '93.
- (24) Q So you think it was coined around late '93?
- (25) A Best as I can recall.

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- (1) Q What was the first product that it was used
- (2) with for marketing purposes?
- (3) A Well, the discussions that I'm talking about
- (4) were Nordic discussions. And I -- so I would believe
- (5) it was first used in conjunction with Nordic.
- (6) MS. KORDZIEL: Can we go off the record?
- (7) (A discussion was held off the record.)
- (8) MS. KORDZIEL: Mark this Exhibit 17.
- (9) (Marked for identification: Respondent's
- (10) Exhibit Number 17.)
- (11) Q (By Ms. Kordziel): It's a document
- (12) bearing Bates numbers 99784 through 99788. Can you
- (13) identify this document?
- (14) A I don't -- I don't believe I've seen it before,
- (15) but the first page appears to be a pin-out for
- (16) Nordic.
- (17) MS. KORDZIEL: Also I note it starts on
- (18) page six and appears to be part of a larger
- (19) document. So counsel, if you can look for the rest
- (20) of this document --
- (21) MR. LEVIN: Certainly.
- (22) MS. KORDZIEL: Also turning to the next
- (23) page, Bates numbers 99785, there appears to be a lot
- (24) of other revisions of this document, of the pin-out.
- (25) MR. LEVIN: Uh-huh.

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- (1) MS. KORDZIEL: So if you can look for
- (2) those revisions, too.
- (3) MR. LEVIN: Okay.
- (4) Q (By Ms. Kordziel): Mr. Dickinson,
- (5) have you ever seen the pin-out specifications for the
- (6) Nordic product before?
- (7) A Not -- not that I recall.
- (8) Q Looking at Bates 99785, are those descriptions
- (9) of previous revisions?
- (10) A Excuse me?
- (11) Q Would this be a description of the previous
- (12) pin-out revisions?
- (13) A Well, I think this is a list of changes.
- (14) That's what that means to me.
- (15) Q So as of that date, would that have been the
- (16) date of the change?
- (17) MR. LEVIN: When you say "that date," are
- (18) you referring to these dates that appear in the text
- (19) on individual lines?
- (20) MS. KORDZIEL: That's correct, next to
- (21) revision numbers, like, for example, if you look the
- (22) at page 99786, there's a date 10-28-93, revision 1.5,
- (23) modifications.
- (24) MR. LEVIN: Uh-huh.
- (25) Q (By Ms. Kordziel): Is it your

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- (1) understanding that the items listed under there would
- (2) have been the modifications with respect to that
- (3) revision?
- (4) A That's how it appears. I mean that's the way
- (5) it looks to me.
- (6) Q Would these pin-out specifications ever have
- (7) been given to customers?
- (8) A Yes, they would be. If you're asking would
- (9) this document have been given to customers? I would
- (10) say no. Would pin-out specifications have been given
- (11) to customers? The answer is yes. And one of the
- (12) documents that we looked at earlier indicated that
- (13) the plan was to give pin-outs to the customers in
- (14) February, if I recall correctly.
- (15) Q What about register definitions or
- (16) specifications, would those have been given out to
- (17) customers?
- (18) A Yes. And again I think there was an indication
- (19) on that one schedule document that pin-outs and
- (20) register information would be provided in February to
- (21) the beta site customers.
- (22) Q Looking back at the previous exhibit --
- (23) A Which one?
- (24) Q Exhibit 15.
- (25) A Exhibit 15? Okay.

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- (1) Q If you turn to Bates 99807 -
- (2) A Okay.
- (3) Q In one of the earlier documents, we had
- (4) discussed that the functional specification had been
- (5) released to customers in November of '93. Would this
- (6) have been something that would have been released to
- (7) customers then?
- (8) A Well, first of all, this is dated -
- (9) Q I'm sorry.
- (10) A - in February.
- (11) Q I'm sorry, a previous version of this document.
- (12) A And secondly, I think as I said a moment ago,
- (13) the schedule that we were looking at earlier
- (14) indicated that the plan was to release register
- (15) information in February of '94.
- (16) Q What would have been the functional spec - not
- (17) the functional spec, but the - going back to Exhibit
- (18) 11 -
- (19) A Right.
- (20) Q - page 110788, on the fourth line it says
- (21) "Presentation of completed Nordic spec to Beta
- (22) sites."
- (23) A Yes.
- (24) Q What would that Nordic specification have
- (25) entailed? Would it have entailed register

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- (1) definitions?
- (2) A No, I don't believe so, because again you'll
- (3) notice the first mention of register spec and pin-out
- (4) is scheduled for February of '94. The completed
- (5) Nordic spec I believe would have been a list of
- (6) features basically describing the functionality of
- (7) the part.
- (8) Q How is that different from a data sheet or a
- (9) functional spec?
- (10) A Well, it's probably not much different from a
- (11) functional spec. I mean it is a form of functional
- (12) spec.
- (13) In terms of a data sheet, as I had
- (14) mentioned before, I think that a data sheet would
- (15) incorporate much of the same information that the -
- (16) this completed Nordic spec would, but it would
- (17) probably have some additional information, and would
- (18) be in a data sheet format.
- (19) Q Okay.
- (20) A But even so it's pretty clear from this page
- (21) that it didn't go as far as register definitions and
- (22) pin-outs in the November time frame, that that didn't
- (23) happen until the February time frame.
- (24) Q In your customer - in your meetings with
- (25) customers, did you ever talk about patent issues?

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- (1) A I would say as a general rule, no. There may
- (2) have been exceptions to that, but generally speaking,
- (3) that would not be a topic of discussion.
- (4) Q So you wouldn't discuss whether or not a
- (5) certain product was subject to a pending patent
- (6) application or -
- (7) A No.
- (8) Q - a patent?
- (9) A No.
- (10) MS. KORDZIEL: I'll have this marked as
- (11) Exhibit 18.
- (12) (Marked for Identification: Respondent's
- (13) Exhibit Number 18.)
- (14) Q (By Ms. Kordziel): These are three
- (15) articles, one by Anthony Cataldo -
- (16) A Right.
- (17) Q - an Edge article, and also an article by Jeff
- (18) Maco. Are you familiar with these articles?
- (19) A I may have seen them at the time, but I don't
- (20) have any recollection at this point as to whether I
- (21) did or not.
- (22) Q Can I see the one I gave you?
- (23) A Sure.
- (24) Q I'm sorry.
- (25) (A discussion was held off the record.)

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- (1) Q (By Ms. Kordziel): Looking at the
- (2) first article by Anthony Cataldo, would this be a
- (3) product announcement of certain products?
- (4) MR. LEVIN: Objection, lack of
- (5) foundation. He's already testified he doesn't
- (6) remember seeing these articles before. The best
- (7) evidence rule says the document speaks for itself.
- (8) You don't need him to interpret it. I don't
- (9) understand the thrust of this question. I hope we're
- (10) not heading towards the same grounds of my objection
- (11) to Exhibit 16.
- (12) MS. KORDZIEL: Your objection's noted.
- (13) THE WITNESS: I'm sorry, the question
- (14) was -
- (15) MS. KORDZIEL: Could you repeat the
- (16) question, please?
- (17) (The record was read by the reporter as
- (18) follows: "Looking at the first article
- (19) by Anthony Cataldo, would this be a
- (20) product announcement of certain
- (21) products?")
- (22) THE WITNESS: That's what it appears to
- (23) be, because it talks about Western Digital and Cirrus
- (24) Logic introducing controllers. Although it's not
- (25) clear - the fact that it's discussing products from

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- (1) multiple companies, two companies, doesn't make it
- (2) clear whether it's actually contemporaneous with
- (3) either company's product announcement, or whether it
- (4) simply is sort of a round-up survey article of recent
- (5) announcements. Not having read it, I don't know
- (6) which is the case.
- (7) Q (By Ms. Kordziel): Turning to the
- (8) next page, if you'll look at the second full
- (9) paragraph, it refers to the Motion Video
- (10) Architecture. Do you see where that is?
- (11) MR. LEVIN: I'm sorry, I'm going to have
- (12) to object. He's just testified he has not read this
- (13) article. I can guess where this testimony -- where
- (14) you may intend to go with this testimony. But again,
- (15) he's not going to testify on any grounds related to
- (16) patent infringement or anything involving the -- how
- (17) these articles may have been involved in patent
- (18) proceedings.
- (19) MS. KORDZIEL: Your objection's noted.
- (20) MR. LEVIN: Well, is there a question
- (21) pending now?
- (22) MS. KORDZIEL: No, I don't believe so.
- (23) Q (By Ms. Kordziel): Now is this the
- (24) Motion Video Architecture that's referenced in the
- (25) second paragraph that we had discussed earlier today

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- (1) with respect to the Nordic, the 7542 product?
- (2) MR. LEVIN: Objection, lack of
- (3) foundation. He stated he has not read this article
- (4) before. Best evidence rule says the article speaks
- (5) for itself.
- (6) Could you phrase that question in such a
- (7) way that it does not require him to interpret this
- (8) article? If you want to know whether a product
- (9) includes the Motion Video Architecture, why don't you
- (10) just ask that? Why does he have to interpret this
- (11) article, unless it's for improper purposes.
- (12) I just do not see a valid reason for
- (13) asking him to interpret this article that he has not
- (14) read before. I'm deeply troubled, because I can
- (15) guess where this is headed. I think it's improper.
- (16) Q (By Ms. Kordziel): Well, you can
- (17) answer the question. It's just a yes or no
- (18) question. Is this Motion Video Architecture the
- (19) Motion Video Architecture that we were discussing
- (20) earlier today with respect to the Nordic product?
- (21) MR. LEVIN: No, I object to the question,
- (22) I think it's ambiguous, misleading. You have not
- (23) referred to a particular line in this article. It's
- (24) not clear what you're referring to. And I don't
- (25) believe he's had a chance to read the entire article.

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- (1) Q (By Ms. Kordziel): If you'd like a
- (2) few minutes to read it, that's fine. But I'm
- (3) referring to paragraphs two and three.
- (4) MR. LEVIN: Could we go off the record
- (5) for a few minutes and maybe discuss this? Because
- (6) this is not going to be productive.
- (7) MS. KORDZIEL: Sure. We can go off the
- (8) record.
- (9) (A discussion was held off the record.)
- (10) MS. KORDZIEL: We can go back on the
- (11) record.
- (12) Q (By Ms. Kordziel): Does this article
- (13) refer to the Cirrus 7542 product?
- (14) A Yes.
- (15) Q Does the 7542 product include the Motion Video
- (16) Architecture?
- (17) A Yes, it does.
- (18) Q Does this architecture include a YUV to RGB
- (19) color space converter?
- (20) A Yes, it does.
- (21) Q Does that architecture also include hardware
- (22) zooming?
- (23) A I believe so.
- (24) Q Does the Motion Video Architecture include a
- (25) multiformat frame buffer?

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- (1) A Yes, it does.
- (2) Q Does this article also refer to the 5440
- (3) product?
- (4) A Yes, it does.
- (5) Q Does the 5440 product include the Motion Video
- (6) Architecture?
- (7) A I think I have to qualify my answer to that by
- (8) saying again that Motion Video Architecture has two
- (9) aspects. One is the marketing aspect. And if I
- (10) assume that this article is representing correctly
- (11) the release that we made, which I don't know for a
- (12) fact, but if I assume that, then I would say that
- (13) what we did was use, from a marketing standpoint,
- (14) the -- the trademark "Motion Video Architecture" to
- (15) apply to both products, the 7542 and the 5440.
- (16) My understanding is that when you look at
- (17) the actual architecture of the devices and the design
- (18) of the devices, that they are in fact different. So
- (19) to say that they incorporate from a technical
- (20) standpoint the same Motion Video Architecture I think
- (21) would not -- based on my understanding -- would not
- (22) be correct. And if one looked at a document for the
- (23) 5440 similar to the design specification that we were
- (24) looking at for the 7542, I would -- I would believe
- (25) that we would -- that a technical -- person with

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- (1) technical proficiency and depth, which I don't
(2) represent myself to be, would see many and perhaps
(3) even fundamental differences between the two.
(4) MS. KORDZIEL: Okay. No further
(5) questions. Depending on the documents, the technical
(6) documents and the marketing documents that you're
(7) actively looking for and will hopefully give to us,
(8) we may have to continue the 30(b)(6) deposition
(9) sometime next week.
(10) MR. LEVIN: Well, I just would like to
(11) say for the record that we've worked very hard since
(12) the second document request was served, as you know
(13) from correspondence, and produced thousands of pages
(14) of documents, including I believe all the exhibits -
(15) well, many of the exhibits used today.
(16) Nevertheless, we continue to endeavor to
(17) locate any additional documents, and I'll keep you
(18) informed as to whatever else I'm able to turn up.
(19) MS. KORDZIEL: Okay. We can go off the
(20) record.
(21) (Whereupon, at 5:05 p.m., the deposition
(22) of Robert V. Dickinson was adjourned.)
(23) _____
(24) ROBERT V. DICKINSON

DEPOSITION

0187

1

1 STATE OF CALIFORNIA)

2

) ss.

2 COUNTY OF SANTA CLARA)

3

3

4 I, Joann Ruth Weber, a Certified Shorthand

4

5 Reporter in and for the State of California, hereby

5

6 certify that the witness in the foregoing deposition,

6

7 ROBERT V. DICKINSON,

7

8 was by me duly sworn to tell the truth, the whole

8

9 truth, and nothing but the truth in the

9

10 within-entitled cause, that the foregoing is a

10

11 full, true and correct transcript of the proceedings

11

12 had at the taking of said deposition to the best of

12

13 my ability.

13

14

14

15

Joann Ruth Weber, CRR 2815

15

Date: December 7, 1998

16

16

17

The deponent personally appeared before me on

17

18 the ____ day of _____, 19____, and was

18

19 given the opportunity to read the deposition, and

19

20 thereafter signed it on the same day.

20

21

21 Upon completion of the foregoing transcript, the

22

22 witness was notified it was ready for signature, but

22

23 the deposition was not signed by the witness for the

23

24

24 following reason: _____

25

25

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